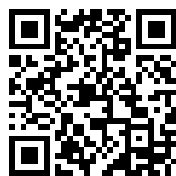

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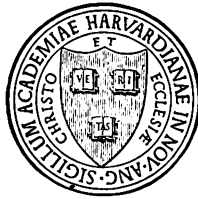


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World Peace Foundation

1912

THE ARMY REVIEW

Published under the direction of the
Chief of the Imperial General Staff.

Volume II
JANUARY-APRIL
1912



London
Published by His Majesty's Stationery Office
1912

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JAN., 1912.

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[Reproduced and printed for the War Office, from a map of Northern India, published by the Surveyor-General of India. Ordnance Survey Office, Southampton, 1911.]

NOTICE.

All Communications should be addressed to—

The Editor,

THE ARMY REVIEW,

War Office,

London, S.W.

The Title page and Index of Volume I are circulated with this Number.

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ARMY COUNCIL LETTER.

1
Establishment (D.S.D.)
 664

WAR OFFICE,
 LONDON, S.W.

19 December, 1911.

SIR,

With reference to War Office letter No. 1 [Establishment] 635 (D.S.D.) dated 19th April, 1911, on the subject of contributions to *THE ARMY REVIEW*, I am commanded to inform you that it has been represented to the Army Council that the sentence: "When exception is taken to the opinions of an author, reservations will be made as required," contained in the fifth paragraph of the letter referred to, has given rise in some instances, to the belief that opinions expressed in articles published in *THE ARMY REVIEW*, without remark, may be considered as having the approval of the Council, or, at least, that the Council are not in disagreement with such opinions.

This is not so. Several articles have been published already, without remark, in which opinions have been expressed with which the Army Council are by no means in agreement; and it is not desired to restrict the scope of the *REVIEW* by forbidding the publication of such articles, so long as they are not considered likely to have a harmful effect on the training or discipline of the Army, or to be otherwise open to serious objection.

In considering the possible effect of the publication, without remark, of views in which they do not concur, the Council assume that all officers who read *THE ARMY REVIEW* have a sufficient knowledge of regulations and of the training manuals to be able to judge without assistance whether the author's opinions do or do not differ in principle from those officially approved; and that, where a difference is recognized, officers will not forget that the official manuals and regulations alone represent the views of duly constituted authority. If *THE ARMY REVIEW* is to be thrown open, as is desirable, for as free discussion as it is possible to permit, it is essential that there should be no misapprehension on this point.

The sentence in the War Office letter of 19th April, 1911, which appears to have caused any misapprehension that may exist, was intended to convey to officers, who may write for the *REVIEW*, that

the Army Council reserve to themselves the right to exclude from articles selected for publication any opinions, or statements, which the Council consider objectionable; but, as is clearly shown in the sentence immediately preceding the one quoted, there is no justification for the view that, consequently, articles published without remark may be taken as carrying official approval.

This letter will be published in the next issue of *THE ARMY REVIEW*, and it is requested that you will cause attention to be drawn to it in your command.

I am,

SIR,

Your obedient Servant,

E. W. D. WARD.

I.

THE DEFENCE OF THE INDIAN EMPIRE. (AN OUTLINE SKETCH.)

INTRODUCTION.

THIRTY years ago the expression "Defence of India" carried a meaning which, to the majority of Englishmen, implied a strategical study of the North-West Frontier in its relation to a direct attack by Russian troops through Afghanistan. There was a natural tendency to think that the study and solution of the problem might safely be left to the few statesmen who had a special knowledge of its conditions, and to the soldiers whose training gave them the right to speak with authority on the application of the principles of strategy to this particular case. In the circumstances of the time, this tendency was no doubt justifiable, and the confidence placed in the trustees was amply repaid by the labour and study given to the subject by a large number of distinguished men.

Even they, however, regarded the problem only from one point of view, looking north-westwards from the banks of the Indus to the steady advance of the Russian military forces from the Caspian Sea. To most of them defence meant little more than the protection of territory against direct attack, or against advances which might ultimately facilitate actual territorial aggression. The word Empire, in its application to India, had, in fact, only just been suggested, and had but little influence on their conception of the conditions of the problem. It was not sufficiently realized that an Empire has interests as well as territory to be defended, and that the Indian Empire, as part of the larger British Empire, has duties and responsibilities which may call for adequate preparation and ultimate sacrifices far beyond those required only for the protection of its own interests.

They could not, it is true, have foreseen the startling and far-reaching changes that have taken place since those times, and, moreover, the conditions of the day prevented Indian problems from occupying a prominent place in the eyes of the world. European

nations were engaged in the attempt to adjust their own political conditions, and had little time to devote to the study of the remoter and still embryonic issues of the Far East. The means of communication with the Eastern hemisphere were still unaided by modern invention and science, and by their slowness conveyed an impression of distance which added to the disinclination to carry the mind beyond the European centres of interest. Except for the United Kingdom, the pressure of increasing populations had not made itself felt to any appreciable extent, and, on the other hand, the slow development of Oriental races gave no cause for attracting the attention of Europe to the possibilities of the future of the East.

Now, however, Europe has discovered that India is no longer in a sphere of its own, removed from the pathway of foreign expansion and economic interests. The modern estimate of distance is based on a measure of time, in days, minutes, and even seconds, as compared to the former measure of weeks and months. The world is thus proportionately reduced in size, so far as the practical activities of its nations are concerned, and the whole of it is brought within the limits of individual imagination and understanding. The problems of commercial rivalry, with or without the expansion of overflowing populations, have brought India into the arena of world politics which may cause its Government to become involved in disputes or entanglements with other Powers or, as in the case of the colour question, with other portions of the Empire.

These are some of the influencing factors which have entirely altered the political conditions of the world, and merit the consideration of all who are interested in the future of the British Empire in general, and of the Indian Empire in particular. One important feature with regard to these changes stands out, however, with great clearness, and gives a warning which cannot be ignored. The comparative rapidity with which they have and are now taking place tells us unmistakably that we may expect increased activity in the future ; that in discussing and deciding each point that arises we must look as far ahead as possible ; that each such point must be considered in relation to the larger issues that may be involved ; and above all that, so far as our system of Government will permit, continuity of policy, whether in political or military matters, must be striven for by those responsible for directing the affairs of the Empire.

It has been indicated above that the military preparations of a nation must be determined by its relationship to the balance of the world, geographically, politically, and racially. They are also governed by the nation's readiness to support its policy by armed force. The military measures that have to be taken with this object must, therefore, be calculated with due regard to the dangers which may be incurred in pursuing a determined course of policy, and must be put in hand in time to allow of their being completed before force is

required. For it must be remembered that it takes many years to design, to forge, and to sharpen this instrument of national policy, and that a weapon that is suitable to meet the dangers of one particular time may not be adequate for those of the next decade. Armed forces can be disbanded and reduced by a stroke of the pen, but they cannot be improvised when hostilities begin. It is necessary, therefore, to make an attempt to see into the future and to draw some conclusions as to the probable course of British policy which may be necessitated by future conflicting interests.

THE WESTERN POWERS.

In the Western hemisphere the maintenance of the balance of power has, in the past, been the bedrock of British policy, and, so far as we know, it is our policy still. The gradual advance of civilization, the better mutual understanding of the aspirations and characteristics of rival nations, and the transfer of power from autocracy to democracy, have all tended towards a state of equilibrium which, like the cooling and hardening of the earth's crust, may, when the process is complete, result in a peace from which some enthusiasts think that the condition of armament may gradually be eliminated. In the meantime, though wars produced by the ambitions of individuals or dynasties may not recur, the process of settlement may nevertheless be attended by violent eruptions such as have had their effect in determining the final form of the earth's topography. The century is only 11 years old, yet it has seen five Great Powers engaged in war, and campaigns fought which rank among the greatest of modern history. The nearer the final form of equilibrium is approached, the more will the internal pressure of expanding nations seek an outlet along the line of least resistance and into a region where adequate force does not oppose and control its advance. Limited as we are to a consideration of the factors which affect the Indian Empire, it is only necessary to refer to those Western nations that are likely to find that the line of least resistance runs in an Easterly direction.

RUSSIA.

The Anglo-Russian Agreement, coupled with the results of the Japanese War have, at all events temporarily, arrested a movement which, previous to these events, gave cause for anxiety in Asia. But the fact that a proposal is being considered for a railway which shall link India with Russia, and thus decrease the value of the barriers which have given protection to India in the past, leads our thoughts into the far future when existing conditions may have changed. As with the Russian *entente*, so with the present policy of preserving the independence of Persia. Policies and *ententes* are liable to change with changed circumstances. Moreover, the independence of Persia

depends on the Persians being able to establish and maintain a Government and an army strong enough to assert independence and to resist the pressure of European nations. Again, it may be pointed out that railways once laid down are never taken up again, whether they pay or not, and that the tendency of the time is for the political expansion of Powers to follow along lines of railway created by national enterprise.

Before the Persian question, in its more recent form, came on the stage of international politics, a Russian advance on Afghanistan, as a preliminary to a threat of invasion of India, was uppermost in the minds of those who thought and wrote about the defence of India. Afghanistan, however, is not Persia. A strong, if autocratic, government; a population, the more important sections of which, though divided on many points, have strong common characteristics of love of independence, hatred of the non-Muhammadan foreigner, and fighting qualities of a high order; the natural difficulties of the country to be traversed—all tend to divert an advance to a line offering fewer difficulties. The Amir has, moreover, definitely committed himself to a policy of national armament in addition to such steps as he is taking to improve his regular army. He has also resolutely set his face against any railway construction policy, and has as yet not recognized the Anglo-Russian Agreement. Without going so far as to say that Russia can never again entertain the idea of establishing herself in Afghanistan, the conditions all seem to favour the policy of treating that country as a buffer State—as an Asiatic Switzerland—whereas the Persian situation seems to offer conditions of a very different kind. The development and future protection of British trade are purposely omitted from this paper, but they seem to point in the same direction.

The conclusion drawn from the above considerations is that, so far as Russia is concerned, the possible future danger lies in Southern Persia and the magnetic attraction of the Persian Gulf, though actual military operations on this line would no doubt be accompanied by a threatened advance through Afghanistan, so as to contain our divisions in the north of India. The extent of this advance would depend on the Amir's attitude and the progress that Russia had made in arranging terms with him.

TURKEY.

The existing state of affairs in Turkey should warn us to avoid ground on which angels may fear to tread. Any attempt to calculate dangers to the Indian Empire on account of Turkey is hampered by so many doubtful factors, both within and without Turkey in Europe and Asia, that the task is almost hopeless, and, in any case, must be closely restricted in its scope. The internal forces at work are complex beyond analysis in a paper of this description, and the

ultimate result of the external pressure of conflicting European interests can only be approximately estimated. A comprehensive scheme of military reorganization has been prepared and is described in another article. Given time, money, and continuity of policy, this will result in an army of 14 army corps, which, if employed for purposes hostile to the British Empire, would throw a great strain on our military forces, and especially on the Army in India.

One motive power which might bring this force into action consists in the tie of religion which unites, or is supposed to unite, all Muhammadans, not only in the Turkish Empire, but in the whole of Central Asia and India. It is urged that the abandonment by the Sultan of the traditional title of Caliph has materially impaired the cohesive force of this power, and it is known that the hostility of Shiah to Sunni is almost as bitter as that of Christian to Jew in the Middle Ages. On the other hand, history tells us not to rely on the sectional differences in a common religion when a wave of fanaticism calls on all co-religionists to exterminate the unbeliever. The Turkish Government, and very possibly the Turkish army, if left to themselves, might perhaps not respond to this call, but the danger cannot be entirely ignored, especially in view of the existence of the large Muhammadan communities in India and across her frontiers.

Recent Turkish activity on the western border of Persia and towards and along the Persian Gulf littoral has, perhaps, little real driving power behind it. It is probably only the result, at the end of the chain, of the more or less spasmodic jerks given at Constantinople by the party temporarily in power. It has taken the form of petty acts of bullying on the part of local Valis, who combine a desire to ingratiate themselves with the Government of the day with a readiness to indulge their cupidity at the expense of individuals who hold views other than their own. The net result, however, whether it be due to a deliberate policy on the part of the Government, or to isolated action of a local magnate, may easily prove prejudicial to British permanent interests, and may before long require the application of force, if the nuisance be not peremptorily checked by diplomatic action. The force required would have to come from India, and it would have to be of sufficient strength to reach a definite strategic objective, and to obviate the risk of encountering superior force.

GERMANY.

The transfer of German Army Corps to the frontiers of India is not at present, or in the immediate future, a matter of practical attainment, though, should need arise, the difficulties that stand in the way are not perhaps beyond the power of German ingenuity and perseverance to overcome in time.

The Turkish army in Asia Minor and Mesopotamia, reorganized and equipped with German help, might, however, serve Germany's

ends just as well as her own army, and the Turkish army lies far closer to the point to be threatened.

As in the case of Russia, so with Germany, Persia and its future railways attract our attention, give occasion for the greatest prescience on the part of our statesmen, and seem likely to require the most sustained attention on the part of strategists.

FRANCE.

French interests in the Far East are mainly centred on expansion of trade and commerce, as distinct from the necessity of providing for a growing population. We are chiefly concerned with her position in Annam and Tonkin. Our mutual recognition of the independence of Siam is a guarantee that we are not likely to come into conflict in working out our respective lines of policy. If, moreover, the interests of either of us, or of Siam itself, should be threatened by a third Power, we are more likely to combine in any action that might result, than to find ourselves in opposition to each other.

THE EASTERN HEMISPHERE.

We have so far been considering the possible effect on India of the expansion of trade and population from certain European nations. In Asia itself, however, several problems are forcing themselves to the front, and have their origin in the development of Eastern nations independent of, though affected by, the movements first dealt with.

JAPAN.

Starting, as Japan does, as a great Power with first-class naval and military strength to support her, her policy is likely to be vigorous, and her progress as rapid as circumstances will permit. The expansion of her trade and the stream of an over-flowing population will, if they take an easterly direction, bring the United States on to the scene as one of the balancing Powers. This aspect of the question need not be pursued as it takes us from our immediate subject. Upon the continent of Asia, Japan has secured a firm footing as the result of her splendid efforts in her last war, and her officers have done much to lay the foundations of a modern army in China.

CHINA.

Much has been written about the regeneration of China. It is therefore unnecessary, even if space permitted in a paper which has no pretension to be exhaustive, to do more than refer to the salient points which bear on our subject. The individual Chinaman is believed to possess virility, pertinacity, and honesty which have brought him success in many parts of the globe, though as a nation, or group of

nations, the Chinese have hitherto displayed characteristics which exhibit themselves most conspicuously in violent repugnance to the intrusion of foreigners, a fatalism which militates against any progress, and a total lack of any desire to interest themselves with the affairs of the rest of the world.

Whether this condition of the national mind be due to the influence of religion, to the corruption which saturates the official classes, or to opium smoking, need not be inquired into. It does, however, seem pertinent to suggest that the reform movement which is now in progress, stimulated by the possible infusion of Japanese energy and the drastic restriction on the growth of the poppy, may have enormous effect in the near future on both the individual and national character, and especially on the hitherto much despised army.

However this may be, we are at present confronted with a policy of deliberate extension of administrative control in a westerly direction which may carry this advance, like a rising tide, into the furthest recesses of all territory over which Chinese ingenuity can suggest even the most shadowy claim to suzerainty. It is conceivable that this expansion will continue until it is arrested either by military force, or by a line of boundary pillars, the passing of which would immediately bring a detachment of the Indian army to the spot or a British squadron to the Gulf of Pechili. When it is remembered that Chinese pretensions include Nepal, Sikkim, Bhutan, Burma, and Siam, as having paid tribute to China, or as having in some way recognized her overlordship, it seems possible that something more than a diplomatic protest at Peking may hereafter be required to stay the advance.

It has been urged, and it is generally believed, that we can effectively control the situation by diplomatic pressure applied in Peking. This might be true if we were dealing with a Power whose Government was so centralized and so paramount that it could reckon on every official in the Empire responding at once to its slightest wish. The viceroys of the remote provinces have, however, a large measure of independence, the distances are enormous and the means of communication slender, even where they exist. Moreover, the forward impulses given when a progressive party is in the ascendant are acted on in due course when they reach the border, whereas orders to withdraw are less cogent and less popular on the frontier, and complete obedience depends on the character of the man on the spot and of those through whom the orders have been transmitted. The present and late viceroys of Szechuan have a forward policy in their minds, and are quite capable of ignoring or evading reactionary instructions.

In the same way, when it comes to the application of force to resist further advance, local steps may have to be taken in addition to the possible despatch of an expedition to threaten or attack the central power. Otherwise, local Chinese forces will raid unchecked

into British territory and do incalculable harm before they are recalled. An example of this was recently afforded on the Burma-Yunnan frontier, where the further advance of Chinese troops was only stopped by the military support known to be available behind Mr. Hertz's administrative column.

It is not only on this frontier that similar action may have to be taken in future. With our consent, China is actively engaged in establishing her administration in Thibet, but her views as to the limits of Thibetan territory are strongly coloured by the almost prehistoric pretensions to suzerainty referred to above, and by the policy based on these claims. From around the whole of the north-east salient, which includes Assam and Burma, she is not unlikely to press forward just so far as we allow. Unless we employ successfully the forces of diplomacy to check her advance, we shall, in the not far distant future, be compelled to increase largely the peace garrison of Assam for the protection of its tea plantations and the millions of British capital involved in this industry.

On the north, Russia has recently taken a very firm line in her dealings with China, and, whatever the merits of the points in dispute may be, it is perfectly clear that firmness and plain speaking are the only methods which carry conviction to the evasive and procrastinating minds of the Chinese authorities.

Encouraged by this success, we may expect that Russia will continue the process, and enforce other terms which may be required to favour her policy towards China, and, indirectly, we shall benefit by this in our opposition to Chinese pretensions to suzerainty over Nepal and the other States which have been mentioned, provided we are equally firm. The struggle resolves itself into one for political control over the foreign relations of these States, and is of vital importance to the defence of India.

BUFFER STATES.

This brings us to a consideration of the so-called Buffer State policy, the leading idea in which seems to be that India's land frontiers should be encircled by semi-independent States, whose foreign policy we should control in return for their keeping outside nations at a distance from our frontier, and thus giving us time to concentrate for their defence as well as our own. Whether this definition be accurate or not, it may be predicted that the forces of expansion, either from Europe or from Asia itself, will surge towards our frontiers, and, like ocean currents, will encroach wherever there is insufficient resistance. Firmly established States, like rocky islands, or those that are protected by the breakwaters of treaties or international agreements, may withstand the pressure, but States which show no sign of ever being able to assert their independence, and wild half-savage tribes, are bound to be engulfed and swept away like sand.

In which of these categories will the following ultimately be found ? Persia, Afghanistan, Kashmir, Nepal, Sikkim, Bhutan, the little known tribes on the borders of Assam and Upper Burma, Yunnan, and lastly Siam. Yunnan has already gone, and India marches with China on this frontier with no intervening buffer. The same will happen on the Eastern Assam and Upper Burma frontiers when they are demarcated. It is, therefore, of urgent importance to delineate these unsettled frontiers in such a manner as will best serve the future interests of the Indian Empire. Otherwise, the Akas, Daphlas, Abors, Mishmis, Hkamtis, Kachins, &c., will pass under Chinese rule, the boundary pillars will be in unpleasant proximity to India's richest possessions, and a line will be drawn which will be strategically hard to defend. It is recognized that the geographical delimitation of frontiers must be preceded by accurate survey, and that this, in the present state of the country, would be attended by serious difficulties. The question is, however, so urgent that a provisional settlement should be arrived at couched in general terms, which may be capable of subsequent interpretation, *e.g.*, the watersheds which define the drainage of the lower Brahmaputra and Irrawaddy, or in terms of latitude and longitude.

INTERNAL INDIA.

Ever since the convulsion which shook India 55 years ago, the steps necessary to protect the loyal and law-abiding majority against the aspirations and conspiracies of agitators have received the attention which the serious issues involved have warranted. The results to-day are satisfactory. The hold which the various Departments have on the situation ; the political measures that have been and are being taken ; the growing knowledge that the masses of the people are at heart contented with our rule ; the complete information which we possess of the movements and intentions of the malcontents, combined with the military preparations to deal promptly with any rioting which might develop into something more serious—all show that the Government is fully alive to its responsibilities, and, at the same time, ready for any move on the part of the disaffected minority.

It is possible, however, that an abnormal state of affairs, arising out of a great campaign, on or beyond the frontier, might give the would-be revolutionists opportunities for working on an ignorant population, and might cause the Government inconvenience in keeping the country quiet at the same time that they were engaged in external war. The chances of possible conflict with various great Powers have already been referred to above. War with Afghanistan, which has not been mentioned, would probably involve the necessity for dealing with the tribes on the North-West Frontier as well. Many of these lie within our administrative frontier, and their rebellion would arouse serious unrest among their friends and co-religionists

in the north of India. Such a war, therefore, has a more immediate bearing on the internal peace of India than a war with one of the great Powers. Trouble with Afghanistan and the tribes would increase our difficulties in India, whereas war with a European Power might rally to the side of the Government even the forces of discontent, as their leaders know well that they have nothing to gain and everything to lose if British rule should be replaced by that of any other foreign nation.

The tribes on the north-west have an aggregate of some 300,000 fighting men, of whom every third man is armed and every fifth with a modern breech-loading rifle. For years there has been a tendency in Afghanistan—possibly not countenanced by the Amir himself—to make difficulties for the Government of India in its relations with the tribes, and to identify the interests of the tribesmen with those of Afghanistan. It is apparent, therefore, that we should have a formidable task on our hands if it were necessary to go to Kabul to impose our will on the Amir. Briefly stated, this task, coupled with the necessity for keeping the peace in India, is estimated to require the mobilization of the whole of the divisions, cavalry brigades, and internal defence troops which constitute the Army in India. There are many variations of the problem of the North-West Frontier, including the case of our having to occupy the Amir's territory in fulfilment of our engagement to protect him from external attack. It is unnecessary to describe these in detail, but in every case the attitude of the tribes, or of some of them, and the effect produced on the people in the north of India, are uncertain factors which may add to the difficulty of maintaining order while a campaign is in progress.

THE STRENGTH OF THE ARMY IN INDIA.

If it be granted that general policy should be guided by far-reaching foresight, it must be admitted that this also applies to the policy of military organization, if effective support is to be available when required. It must be remembered that this support is necessary even though war should not result. Germany has been at peace for 40 years, but everyone knows that any success which has attended her course of policy has mainly been due to the military power behind it. There is no need, therefore, to discuss the question whether we are ever likely actually to go to war with Germany, Turkey, Russia, China, or Japan, for, even if the answer were in the negative, it should have no effect on our military preparations. The real question is, at which points is the policy, which is designed to protect our interests, likely to clash with the natural expansion or the designs of other nations? This is for our statesmen to answer. The military authorities must, however, be continuously in the confidence of the Government in this matter, and must know their policy and intentions. If, in the last

resort, war should be the only alternative, the army will then have had a chance of being ready for the purpose of giving effect to the nation's will.

While waiting for the answer to the above question, we may, in the meantime, conclude that Persia and the Gulf, Afghanistan, and the North-East Frontier are the points of danger, and that the size of the force to be held in readiness, as a deterrent to others or for use if required, should be proportionate to the interests involved, and the operations which might have to be undertaken. The first may reasonably be held to concern the whole Empire, whereas, in the other cases (including internal trouble under normal conditions), India is expected to rely on the Army in India. Even in the time when no other thoughts but those of a Russian advance occupied our minds, it was accepted that the Army in India was designed only to meet the first attack and to gain time for successive reinforcements to arrive from England until the safety of India was assured. The conditions of to-day point to the possibility of dangers not less serious than formerly, and requiring sustained attention to our military affairs. It is all the more important to emphasize the value of the principle, now formally accepted, that each portion of the British Empire should be prepared for its own defence in the first instance, on the understanding that the rest of the Empire is ready to come to its assistance. The existing organization of the Army in India has recently been accepted by His Majesty's Government as sufficient to meet India's present requirements. Compared with the territory and interests it protects, and with the population from which the Indian portion is enlisted, the army is small indeed, and in a few years' time it will not improbably be found too small to hold its own until the time when the full weight of the Empire's resources can be brought to bear.

SEA POWER—FIRST AND LAST.

Our minds are thus brought back to the fundamental basis of sea power, without which it is idle to talk of applying our military force at any required point. The Empire has been likened to a pearl necklace, the cord of which is sea power. Break the cord and the Empire ceases to exist as an entity. The welfare of the peoples of India is bound up with the maintenance of the Empire, and cannot prosper or be defended except with the support of an adequate navy co-operating with a sufficient army. If we lose command at sea, India will fall a victim partly to better equipped nations on its frontiers, and partly to the inroads of those to whom we resign sea power. The chief need is a reorganization of Imperial resources and a comprehensive plan of co-operative defence, which will include not only the Dominions, but also India and the Crown Colonies. In this plan India must be prepared to take her place and share of responsibility. Like other

parts of the Empire, she must not only have something to get, but something to give.

AFTER-WORD.

Such are some of the thoughts that arise in the minds of those who reflect on these problems. Soldiers are fully aware that the issues are mainly political, and that they are being handled with the care and skill which the importance and difficulties of such questions demand. It is, at the same time, clear that the military problems which we have to face in India are, both separately and in the aggregate, of a very serious character, and that they require men of a very firm texture of mind to deal with them successfully. We cannot afford in India to have frequent changes of policy translated or accompanied by upheavals in settled military organization, for the safety of the country both within and without rests upon the efficiency of its armed forces, and a voluntary army which is subjected to constant manipulations is not contented, and, consequently, is not safe. Continuity in a wise and carefully thought out military policy is indispensable for all parts of the Empire, but nowhere is it more indispensable than in India.

II.

THE GENERAL STAFF IN INDIA.

IN the first number of *THE ARMY REVIEW*¹ the development of the General Staff was traced up to the creation of an Imperial General Staff, consisting :—

“(1) Of a central body in London working directly under the Chief of the Imperial General Staff; and (2) of local sections in the United Kingdom, in each of our regular garrisons abroad, in each self-governing Dominion, and in India.” The most recent step in this development is the formation of the General Staff in India, and it may, therefore, be of interest to supplement the general review referred to above by some further account of the successive steps leading up to this result. Such is the object of this paper.

In the first place, it must be clearly understood that, although a General Staff was not actually formed in India until April, 1910, the subject had engrossed the attention of the military authorities in that country for some years previously. Indeed, in some respects the General Staff idea had taken definite shape in India before the formation of the General Staff at home, and the delay in actually forming such a Staff has been due :

- (i) To the desire to ensure the General Staff in India being formed on the principles decided upon for an Imperial General Staff;
- (ii) To the practical difficulty of adapting these principles to the actual conditions of the Staff in India.

It was in 1904 that the Home Government accepted the recommendations of the Esher Committee as regards the necessity of a General Staff, although it was not until two years later that the Army Order² forming such a Staff was actually issued. But in 1904 Lord Kitchener had issued his memorandum on “The higher training and military education of officers, the distribution of Staff duties, the responsibility of General and Staff officers, and the training of troops for war,” in accordance with which the Staff in India was divided into the two divisions of “Art of War” and “Routine.” Since the allotment of duties to the Art of War, Staff officers practically

¹ *ARMY REVIEW*, No. 1, page 19.

² Army Order 233 of 1906.

coincided with what are now understood as General Staff duties; the issue of this memorandum may fairly be considered as the first actual attempt in the British Empire to differentiate between the work of the General Staff and of the Administrative Staff.

This first step was, however, never intended as a permanent arrangement, but merely as a transitional one to provide for the period that it was known must elapse before a more perfect arrangement could become possible. A necessary preliminary to any further advance was a reorganization of the Staff at Army headquarters in India, and this was carried out by the formation of the "Division of the Chief of the Staff" in 1906, the same year that saw the formation of the General Staff at home. In the consequent redistribution of duties at headquarters, all regimental training was left with the Adjutant-General, on the theory that the General Staff was concerned only with the training of bodies composed of combined arms of the service, and not with the training of those composed of cavalry, artillery, or infantry only. On the other hand, mobilization and concentration, which are not now looked upon as General Staff duties, were taken from the Quartermaster-General and given to the Chief of the Staff, as well as the preparation of plans of operation, organization, and intelligence. It was thus chiefly from the Quartermaster-General's department that the new department was formed, and this was inevitable, when it is remembered that in India the Quartermaster-General's department had retained the old traditions under which, from the days of Marlborough to those of Wellington, that department had dealt with "such matters as now concern the General Staff, as well as many of those which modern organization assigns in our Army to the Quartermaster-General of to-day."³ It will be seen that the allotment of duties to the Chief of the Staff differed in some important respects from that finally adopted by the Imperial Defence Conference of 1909 as those pertaining to a General Staff. But the establishment of this department at headquarters, taken in conjunction with the division of Staff duties in commands dealt with in the preceding paragraph, undoubtedly established the principle of a General Staff in India.

Next year (1907) a further step was taken, for the Government of India decided that the time had arrived when it had become desirable "to carry the organization of the Army in India another step forward by commencing the development of a part of the existing Staff into the higher form of the General Staff;" and an Army Order to give effect to this view was drafted and submitted to the Secretary of State. But this year saw also at home the meeting of the Imperial Conference, which recognized and affirmed the need of "developing for the service of the Empire a

³ ARMY REVIEW, No. 7, page 16.

General Staff, selected from the forces of the Empire as a whole, which shall study military science in all its branches, shall collect and disseminate to the various Governments military information and intelligence, shall undertake the preparation of schemes of defence on a common principle, and (without in the least interfering with questions connected with command and administration) shall, at the request of the respective Governments, advise as to the training, education, and war organization of the military forces of the Crown in every part of the Empire," and "instructed the Chief of the General Staff to put forward definite proposals to this end."⁴ It was, therefore, obvious that it would be inadvisable to proceed with the formation of a General Staff in India until the conditions of an Imperial General Staff were settled, and it was arranged that these proposals should be submitted for the opinion of the Government of India before they were promulgated, in order that a "mutual organization acceptable to both countries might be evolved."

Putting aside minor matters of detail, the main point of difference between the proposals of the Government of India, as contained in their draft Army Order, and the original home regulations for the General Staff published in 1906, had been in connection with the conditions of service on the General Staff. Lord Kitchener had always held strongly that any idea of the General Staff growing into a caste apart from the Administrative Staff must be carefully guarded against. As expressed in his memorandum :

"It is, moreover, necessary to discard as incorrect the view which has been somewhat widely held that a General Staff includes all officers of the Army, however employed, who possess ability and training of a certain standard . . . the defects which have always proved fatal to it are the inevitable creation of a special and favoured caste within the Army with separate interests of its own, and the eventual loss of all touch between this caste and the troops. The true theory certainly is that an officer belongs to the General Staff only when actually employed on General Staff duties . . . service in other departments of the Staff is frequently a most valuable experience for an officer whom it is proposed eventually to employ on the General Staff, but it should be distinctly understood that during such service he is not a member of the General Staff."

The justness of this view was amply proved when the detailed arrangements for the formation of the General Staff were under discussion in India in 1910, for it then became apparent how widespread was the apprehension that the formation of the General Staff would make a "distinct and permanent cleavage," not only between General Staff officers and the Army at large, but also between the general and administrative branches of the Staff itself. Fortunately,

⁴ ARMY REVIEW, No. 1, page 19.

opinion on this point had changed since the formation of the General Staff in 1906, and when in 1909 the War Office papers regarding the organization and working of an Imperial General Staff, and the draft copies of the new Army Orders⁵ were received in India, it was found that the latter could be accepted, without further demur, as the basis on which the General Staff in India should be formed. In October, 1909, Lord Morley, therefore, definitely authorized the Indian Government to proceed with the scheme for the organization of a General Staff for India "on the lines laid down by His Majesty's Government for an Imperial General Staff."

In addition to authorizing the formation of the General Staff for India, the Secretary of State in this despatch dealt with the various points regarding the Imperial General Staff raised by the Government of India. He stated that a full understanding with the War Office had been arrived at in regard to the adaptation of the general scheme to the special conditions of India; that the Army Council had accepted his stipulations on those details as to which it seemed desirable to guard against the possibility of misconception; that the relations of the Indian General Staff with the Imperial General Staff in London on the one hand, and with the Commander-in-Chief in India and the Government of India on the other hand, had been clearly and fully defined; that the Army Council had recognized the impossibility of applying to India the assumption that in a great war the General Staff officers attached to the supreme Commander in the field would be mainly drawn from officers who had proved their efficiency on the central body of the Imperial General Staff; that the expression "local section" of the Imperial General Staff in relation to India merely indicated the Indian General Staff; and that the apprehensions as to the future of the Indian Staff College were based on a misconception.

All misunderstandings having been thus cleared away, it was possible to proceed with the formation of the General Staff in India. As already pointed out, the foundation for this had already been laid by the separation of the Staff of divisions into the two branches of "Art of War" and "Routine" in 1904, and by the formation of the "Division of the Chief of the Staff" at Army headquarters in 1906. But, in spite of this, the actual formation of a General Staff entailed much anxious thought and considerable delay. In the first place, the pledge that no financial considerations should be involved necessitated no change being made in the total number of Staff officers in each grade throughout India. In the second, the great diversity of local conditions made it impossible to apply to all the so-called divisions and brigades a uniform organization based entirely on war requirements, as had been hoped and intended. Moreover,

⁵ Army Order 263 of 1909.

old prejudices die hard, and apprehensions, such as those referred to above, cannot be ignored, however unfounded they may be. During the winter of 1909-10, besides constant informal discussions, all general officers commanding armies, divisions, and independent brigades were formally consulted, and their views were the subject of the most careful consideration at Army headquarters. It is not necessary to go into the many matters of detail involved in this discussion, but the following paragraphs will give some idea of the complexity of the problem involved in the practical application of the general principles of the organization and working of a General Staff to the actual conditions of the Staff in India.

The first step was to review the distribution of duties at Army headquarters in the light of the Imperial General Staff scheme, which had taken shape since the formation of the Division of the Chief of the Staff. Though generally in accordance with the accepted principles, there were some important points of difference. For instance, as pointed out in paragraph 4, certain matters connected with mobilization and concentration had been allotted to the Chief of the Staff, instead of to the Adjutant-General and Quartermaster-General respectively, while, on the other hand, the Adjutant-General still dealt with a portion of the training, which should have been entirely in the hands of the General Staff. If this distribution of duties at Army headquarters had been maintained, it would have meant that the functions of the Indian General Staff would have differed from those assigned to the corresponding bodies elsewhere. Moreover, to entrust any part of the training of troops for war to a great administrative department, which had enormous responsibilities of an entirely different sort, would have been to perpetuate a system which had in the past militated against success in the field. It was, therefore, decided to adopt the distribution of duties laid down for the Imperial General Staff, and to transfer mobilization to the Adjutant-General, concentration to the Quartermaster-General, and all training to the General Staff. The internal organization of the General Staff Branch at headquarters in India also followed as closely as possible that in force at Imperial Army headquarters,⁶ the only essential difference being the amalgamation of the directorates of "Staff Duties" and "Military Training." This amalgamation was, however, only in accordance with the organization recommended by the Imperial Defence Conference of 1909 for "Local Headquarters' Sections of the Imperial General Staff."⁷

So far as *army staffs* were concerned, no change, except in name, was necessary; for Army Commanders, having no administrative duties to perform, had no administrative staffs.

As regards divisions, it was first necessary to consider their

⁶ ARMY REVIEW, No. 1, page 13 (8).
(1465)

⁷ Cd. Paper No. 4948.

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requirements in war. Taking the home war establishments as the basis, in accordance with the recommendation of the Imperial Defence Conference, the staff required was :—

General Staff.	Administrative Staff.
1 General Staff Officer, 1st Grade. 1 General Staff Officer, 2nd Grade. 1 General Staff Officer, 3rd Grade.	1 Assistant Quartermaster-General. 1 Deputy Assistant Adjutant-General.

And towards this there were in existence :—

Art of War Staff.	Routine Staff.
1 Assistant Adjutant-General. 1 Staff Captain (in 6 Divisions only).	1 Assistant Adjutant-General. 1 Deputy Assistant Adjutant-General.

The administrative staff of divisions was, therefore, complete as it stood, the Assistant Adjutant-General becoming an Assistant Quartermaster-General. As regards the General Staff, the Assistant Adjutant-General, "Art of War" became the first grade General Staff officer. Towards the provision of the other General Staff officers there were only the Staff Captains allowed in a few divisions, and these were required for other purposes. Fortunately, however, there were in existence in certain brigade areas Deputy Assistant Adjutants-General as well as Brigade Majors. These Deputy Assistant Adjutants-General did not belong to the Staffs of the war brigades, and would not have accompanied them on service, and their position was, therefore, anomalous, while their presence certainly lowered the status of Brigade Majors in general estimation. They were, therefore, utilized to provide the second grade General Staff officers of divisions.

But, at the same time, the discussions which took place showed conclusively the absolute necessity of giving a second Staff officer to the larger mixed brigades as an assistant to the Brigade Major. These have been provided from the Staff Captains previously allowed to certain divisions.

By this arrangement the administrative Staffs of divisions were completed as for war, and their General Staff were only left deficient of a third grade General Staff officer who will be appointed on mobilization, while all brigades had their Brigade Majors, and some a Staff Captain in addition.

But in India there are, in addition to the ordinary brigades, or so-called "brigades," the three independent frontier brigades, and also the garrisons, at the defended ports of Aden, Karachi, Bombay, and Calcutta.

The frontier brigades, being independent bodies of troops of all arms, required a General Staff officer, and they were accordingly each given a second grade General Staff officer. With them also administrative questions are of great importance on service as in peace, and it was therefore considered advisable to allow them a Deputy Assistant Adjutant and Quartermaster-General as administrative Staff officer.

The case of the defended ports was to a certain extent analogous. Although termed "brigades," the really important point in their case is local defence. It is, therefore, in the first place, essential that there should be a General Staff officer at each, especially charged with the duties connected with the defences. These are duties for which local knowledge is above all required. An officer, however gifted and highly educated, must be practically helpless until he has acquired the technical knowledge connected with armaments, electric lighting, communications, &c., and until he has made himself familiar with all the conditions of tides, channels, and landing places which affect the local problem of attack and defence. Moreover, he must be in the closest possible touch with all the local officials and the naval authorities, otherwise misunderstandings may easily arise, and offence be taken when none is intended, with fatal results. Secondary only in importance to the duties connected with defence, are those connected with the embarkation and disembarkation of troops, and the considerations regarding local knowledge apply with almost equal force to both. In these brigades also the Staff allowed therefore consisted of a second grade General Staff officer and a Deputy Assistant Adjutant and Quartermaster-General.

The above arrangement, having been approved by His Excellency the Commander-in-Chief and the Government of India, was embodied in two Army Orders, issued in April, 1910,⁸ of which one deals with the formation of the General Staff, the other with the consequent reorganization of the Administrative Staff. The qualifications for the General Staff and the conditions of service on it, as therein laid down for India, are identical with those adopted at home, with one small exception. At home, owing to the South African War, there are a considerable number of officers who have had Staff experience in the field, and the officers eligible to be sent to the Staff College for one year⁹ can, therefore, be limited to those who have shown themselves to be qualified by service on the Staff *in the field*. In India, however, the circumstances are different, and it had always been recognized that some consideration would have to be given to the special conditions which had prevented many of

⁸ India Army Orders 202 and 203.

⁹ The regulations under which officers may be specially selected for a course at the Staff College, Camberley, without entrance examination, have been revised since this article was written; *vide* Army Order 275, 1911. General Staff.

the best officers of the Indian Army from going to Camberley, and that officers, who had shown themselves to be specially qualified for the Staff, should not, therefore, be altogether excluded though they had not had an opportunity of field service. In India, accordingly, the year's course at the Staff College, Quetta, is open to officers who have proved their value by work on the Staff in peace. This is the only difference.

The establishment of a Staff College in India, so as to increase the supply of fully trained Staff officers, was an important feature in Lord Kitchener's scheme. Although so few years have elapsed since its establishment in 1905, it may be confidently stated that it has already more than justified its existence. The attraction of two years at home must always render Camberley more generally popular, but the competition for Quetta is steadily increasing, and the quality of the officers who succeed in obtaining admission is quite satisfactory. It has worked from the beginning in the closest touch with Camberley, and no small tribute to the reputation gained is the desire on the part of the Dominion Governments to send their officers to undergo the Quetta course. Repeated applications have been received from both Australia and New Zealand, but, unfortunately at present, lack of accommodation has rendered the acceptance of officers impossible, except in the case of one Australian officer.

This question of accommodation is a serious one, for it must be remembered that there are no hotels or spare quarters of any sort in Quetta, and the climate, both in summer and winter, is such that tents are out of the question. Not only has the lack of quarters necessitated this refusal of officers from the Dominions, it has also prevented full advantage being taken of the provisions regarding the selection of officers for the one-year course. In India, this is particularly unfortunate, as explained in the preceding paragraph, and the question of increasing the accommodation at the College is now under consideration.

A Staff with the real qualifications of a General Staff cannot be found ready made. The General Staff in India has only been in existence for a little over a year, so it is early days yet to say what effect its formation will have on the efficiency of the Army for war. What is certain is that during the short period of its existence no pains have been spared to prepare its members for the duties which may be required of them in war. Perhaps the most important step has been the assembling of the senior officers of the General Staff of armies, divisions, and independent brigades, and of the Staff College, for annual Staff tours and conferences under the direction of the Chief of the General Staff. This procedure was first adopted in January, 1909, in anticipation of the formation of the General Staff, and has been continued as an annual institution. The benefits derived from these meetings are even greater than at home, since

distances are so great in India that, without some such common meeting-ground, there is every likelihood of divergencies of method owing to the want of opportunity for Staff officers to discuss personally their duties and their difficulties with headquarters or among themselves. Owing also to the great distances to be travelled, it is necessary to combine the Staff tour with the conference in India.

Preliminary to the actual work on the ground at the Staff tours, problems are put forward for solution, so as to afford, to the officers taking part, opportunities of thinking more or less continually of war, and of the requirements of the Army in war, and of their training as Staff officers for duty in war. Moreover, the problems have not been confined purely to General Staff questions, but have, as would always be the case in real war, involved administrative questions as well. These latter have been solved by officers of the Administrative Staff and heads of administrative services in collaboration with the officers of the General Staff, and opportunities have thus been afforded for all branches of the Staff and heads of administrative services to work together.

The aim has further been to ensure uniformity of thought as to the broad strategical and tactical principles as defined in the Regulations. The necessity of such instruction is so clearly set forth in the concluding remarks of "Lessons from two recent wars," by General Langlois, that they may be usefully quoted :

"Yet it does not do to think that training manuals, however excellent, are all that is required to prepare an army for victory. The drill books in England before the Boer War were quite as good as those of other European armies; they were faithfully carried out to the letter, but they were not connected by a general common doctrine.

"This introduces a new factor, which is independent of text books, *tactical education, or doctrine*; a factor which has been rendered indispensable by the increased necessity for initiative. This tactical education is the duty of the supreme commanding authority of the Army; it is his province to establish the doctrine and to instil it into the minds of all.

"Without a doctrine, text books are of little avail; better a doctrine without text books than text books without a doctrine, for the former was the case in Napoleon's time."

It may also be claimed that the General Staff in India has not been forgetful of its part in working up to the ideals of the Imperial General Staff. In the first place, every effort has been made to draw closer the bonds uniting the General Staff in India with the forces of the Overseas Dominions. For some years past a qualified Staff officer has been sent annually both to Australia and Canada for a year's deputation, and these officers have been made use of by the respective Governments in various capacities, but for the most part recently in General Staff duties connected with training.

Australia sends to India about five officers annually, of whom one is a Permanent Force officer who comes for a year, and the remainder are officers of the citizen forces who come for about six months. Canada sends one officer annually, who stays the whole year, and New Zealand now proposes to send four officers annually for six months. The training to be given to all the above has been arranged in consultation with their respective Governments, and in all cases the provisions of the War Office memorandum on the subject of loans, attachments, and interchanges of and between officers of the Regular Army and officers of the forces of the Overseas Dominions have been carefully observed.

At the same time, constant progress is being made towards the adoption of Imperial organization and of Imperial regulations in accordance with the recommendations of the Conference on Imperial defence.

The principle of uniformity of organization, which has been followed so strictly in the formation of the General Staff, is now being extended to all departments, and every opportunity is taken gradually to bring each detail of organization and nomenclature into line with that in use at home so far as the special conditions prevailing in India permit.

The same principle is being followed as regards the acceptance of the Imperial regulations. For instance, as regards the education of officers, the provisions of the King's Regulations have just been adopted *en bloc* for examination for promotion, and the new Staff College Regulations issued this year are practically identical with those for Camberley. Similarly with the training regulations. A recent order¹⁰ lays down that :

"In accordance with the principle that the Field Service Regulations and Training Manuals issued to the home Regular Army should form the basis of the organization, administration, and training of the troops throughout the Empire, the following War Office Regulations have been made applicable to India. Modifications to suit local conditions, where such are unavoidable, are in each case given in an Indian supplement :—

"Field Service Regulations, Parts I and II.

"The Training Manuals of the various arms.

"Training and Manœuvre Regulations.

"Musketry Regulations.

"Field Service Pocket Book."

The delay in forming a General Staff in India was no doubt viewed with impatience by many, but this delay has been chiefly due to the necessity for full discussion of the principles with the authorities at home, and for careful consideration of the difficulties involved in their application to the peculiar conditions prevailing

¹⁰ India Army Order 282 of 1911.

in India. In 1905, the Committee of Imperial Defence expressed the hope "that the efforts for bringing the two branches of the Army into closer touch will be unremittingly continued, especially as regards the formation of a common General Staff," and the War Office paper on "The Imperial General Staff," after laying down the general principles affecting national defence, goes on to say¹¹:—"It is thus evident how closely the forces maintained in various portions of the Empire may be associated in war time. In order that the several parts of such an Army may be able to act in close combination, they must be organized on the same general principles, especially as regards the system of command and Staff duties."

Such an organization, acceptable both to the Government of India and the War Office, has been arrived at, and, in view of this satisfactory result, we can scarcely now regret the time occupied in these negotiations.

It would indeed have been little less than a calamity if the formation of the General Staff in India had introduced any divergence from the principle of unity of organization which has been accepted by the rest of the Empire.

¹¹ ARMY REVIEW, July, 1911, page 10.

III.

THE NORTH-WEST FRONTIER OF INDIA.

By MAJOR G. F. MACMUNN, D.S.O., R.A., General Staff.

THE problem of the North-West Frontier of India is one of those outstanding questions to which there is no immediate solution. In time, by force of circumstances, the troublesome tribal country may be absorbed within British India. The absorption would be a long and difficult process, and would, of course, result in the British and Afghan borders marching together for the whole length of the frontier, as they do now in British Baluchistan.

For a general understanding of such a problem, a working idea of its geography is essential, and it is always difficult to realize geographical conditions without a visit to, at any rate, a portion of the ground. This is especially the case when the region in question is a mass of tumbled mountains, with several confusing defiles that penetrate them, and has few modern features such as railways and trunk roads to attract our attention. The actual orientation is even somewhat confusing, for this portion of the frontier is more a western than a north-western one, but, as we have always had a north-west frontier as our border crept up the map from Bengal, the name has stayed.

To get a good working outline of the country, the following method is recommended. First, Kabul is practically 700 miles due north, or almost due north, of Karachi. If we take a vertical line on our paper of a length to represent 700 miles, and describe an equilateral triangle to the eastward, we get Delhi, and describing it to the westward we almost get Kerman in Persia. On the side Delhi-Kabul, another equilateral triangle gives us approximately Yarkand. With these five points clearly marked on our map and in our minds, the filling in of some of the intervening country is easy enough. Exactly half way between Kabul and Karachi as the crow flies lies Sibi, at the foot of the Baluchistan hills, where that curious double loop line separates to go to Quetta and the frontier via the Harnai and the Mushkaf Passes. Then if we take the portion of an arc of the circle described with Karachi as centre and Kabul as a radius,

that lies between Delhi and Kabul, and divide it into three, we get at the first point from Kabul, Attock, at the old historic crossing of the Indus, and at the next point Amritsar. Now, with one more measurement, we have the whole of the border, for a straight line from Karachi through Attock, 900 miles long, gives us the Killik Pass, away beyond Gilgit and Hunza, which is where the frontier of India, at the roof of the world, ceases to face north and north-west, and turns away to face north-east for twice as far again, to march with the Chinese Empire.

The North-West Frontier is, therefore, an arc, based on a chord 900 miles long, from the Killik to Karachi, and along this border has for neighbours Afghanistan, or the various semi-independent tribes of Afghanistan and Baluchistan, and behind them again the ever-developing territories of the White Tzar. The Indus, subject to the meanderings of a great river, lies along that same line, and only turns south through the mountains of Kashmir, a few miles from Gilgit. The frontier itself has never lain actually on the Indus, but has always practically been at the foot of the hills that skirt the plain of the Punjab. This was the Sikh frontier, as it is ours, and for the same reason, viz., that it is ill taking the breeks off a highlander. From Karachi to the Pamirs by the Killik Pass, an immense tumbled mass of mountains forms the great divide between the basins of the Oxus and the Indus, which, from the low rocky hills near the coast, rise into the Suleimans and the Safed Koh, and finally swell till they meet the Himalayas and the Pamirs.

Through this great divide the races from the Central Asian plateau have ever passed to the conquest of Hindustan. The highways are not numerous, and the further north the more difficult they are. The passes, for instance, such as the Killik, the Baroghil, and the Dora, that connect Gilgit, Yasin, and Chitral with the Pamirs and Badakshan are of immense altitude, extremely difficult, and free from snow for but few months in the year. When crossed, they only admit to a region of few inhabitants, few supplies, and many more mountain ranges to cross. Their military danger lies chiefly in the effect that the presence of a small force on these routes would have on men's minds elsewhere. Coming down from the north, the first main route lies viâ Kabul to the Jellalabad Valley, and from there several routes lead down to India, that by the Khaibar Pass being, of course, the best known as the most used. Further south we have the two routes that lead into the Kurram, by the Shutargardan and Altimur Passes; then again, the less frequented Tochi Valley route from Ghazni, the historical Gomal route, also from Ghazni, and then the various routes from Kandahar that come to Pishin, and thence through the Suleimans to the Indus. In our days, when the desert is spanned by railways, the main route from Kandahar runs through Pishin and down to Sind viâ the Bolan-Mushkaf or Harnai Valleys. In days gone by, the

highway came down through the Suleimans a bit further north, the Sangarh Pass, emerging near Dera Ghazi Khan, being one of the most frequented. There are of these five routes mentioned two that are the most important, viz., that from Kabul viâ the Khaibar, and that from Kandahar viâ Quetta. These are the through routes, the others being subsidiary, as in the case of the Kurram routes, or, in the case of the others, only leading from Ghazni.

The military problems that the North-West Frontier of India present, and that is also to say the political problems, are of two different kinds. There is the big problem that besets all nations who have a land frontier with a powerful, developing neighbour on the far side. Tacked on to this is the similar but lesser problem of a lesser state as neighbour, whose power is constantly increasing, whose people are subject to fanatical waves, and whose past contains a long roll of successful invasions and conquests of the country it is now our business to protect. These two problems, however, are similar in their effect, and only vary in their intensity. They both mean military cognizance and preparation of a definite kind, which is incumbent on every nation that has a land frontier, and are in principle independent of the actual immediate attitude of the neighbour. Quite apart from this problem, which can be tackled on recognized lines, we have the far more pressing, because ever present, problem of the large tract of tumbled independent tribal mountains. From the Killik Pass to the coast by Karachi the indented line of the hills gives us a tribal frontier of over 1,000 miles. Between our administrative border line, which for the most part lies at the foot of the hills, and the Durand line, which is the responsible Afghan frontier for a great part of the way, lies the belt of tribal mountains, averaging perhaps 60 miles in width. From time immemorial the inhabitants, who will be described briefly later, have raided all who traversed their highways, and have flocked, when it suited them, to join the armies of the invaders of Hindustan. As they have been for the last 100 years so are they now; free, democratic to an intense degree, ignorant and intensely fanatical when it suits them, responding freely to the demand for a religious war, bored to tears with peace and order, pining for excitement, eager for adventure, brave and hardy, and by tradition entitled to see the hand keep the head and to live at the expense of the weaker. The problem of neighbourhood is obviously a difficult one.

The trouble that they give us is but the result of a world-wide fact. The mountains produce many, but can grow little foodstuff, and for this same reason annexation presents few attractions to a civilized neighbour. Apart from the difficulties and complications of a frontier co-terminous with that of Afghanistan for many miles of most difficult mountains, any attempt to administer the tribal tracts would probably mean long and costly operations, the making

of many roads, years of subsequent outrage, and an immense demand on revenue, with little return in yield from the hill tracts.

The alternatives are to put up with the present situation, or to put an end to unadministered territory. What this latter involves has just been alluded to, and it will be as well to review the situation as it now presents itself, since for several years to come, at any rate, there is likely to be no change.

From time immemorial the tribes of the independent hills, who have rendered some nominal allegiance to the rulers of Ghazni, Kabul, or Kandahar, have poured into India with the various Tartar, Afghan, and Ghilzai invaders. They have colonized many parts of India, and successful leaders among them have founded dynasties which endure to this day. They have served in every army in India. Rajput, Mogul, Maratha, and British have always hired their services. In 1857 they still thronged the native states, and in the risings of Central India it was the trans-border Pathans who formed the most desperate of our adversaries, as they also formed the stouter part of the city rabble that helped to invest the Lucknow Residency and the Bailey Guard. As Rohillas, they bulk largely in the earlier history of our mission of pacification, and they added their quota to the Pindari hordes.

The situation within their hills has not largely changed within the last few generations. Sikh rule left them severely alone so long as they stayed within the foot hills, and the Sikh border was in a constant state of raid and feud. When the British took over Sikh responsibilities, the cessation of raids was our first object. We have not yet accomplished it, though we have, of course, confined it within manageable limits. Along the whole length of the border, however, there is a large force of armed police, who spend day and night, year in, year out, in watching for raids and warding them off. It is not that our official relations with the tribes are unfriendly. On the contrary, they are usually as correct as is possible considering the democratic uncribbed nature of such tribal government as they have. But to the mass of the younger spirits the counsels of the elders are quite uninteresting, and young blood will have its way. A raid across the border is only the thing for a lad of spirit to do, just as it was in the days, not so very long ago, not only on the highland border, but on the Anglo-Scottish border close to Hadrian's wall. Therefore, it is that for the best part of 1,000 miles the armed police and border militia keep constant watch, and behind them wait the border brigades. Many of these border militias are maintained on the good old policy of setting a thief to catch a thief; that policy which first formed our Black Watch, now the 42nd of the Line.

Clever handling by men who know the tribes keeps the border in good humour as a rule, and what is known as the Sandeman system obtains where possible. That system was based on a principle of

human nature, and consisted of working the feudal spirit for all it was worth. Chiefs were made responsible for their tribes, and were supported and strengthened so long as they worked for the peace and prosperity of their portion of the border. This system was especially successful in Baluchistan, because here the feudal system had long been recognized. In Swat and Dir, and the country north of the Khaiber too, it has met with a good deal of success. In that tumbled mass of mountains that lies between the Khaiber and the Gomal Passes, inhabited by Afridis, Orakzais, and the various Wazir clans, feudalism is of small account. Every man is a law unto himself, after the instinct of the Anglo-Saxon, and headmen, and even tribal elders, have little authority. Our policy, as a people who but desire strong rule for a neighbour, has been to endeavour to strengthen the hands of such *maliks* and headmen as there be, and of the tribal councils generally, so that they may be able to call their misdeameanants to account. The measure of success is not very evident in the more democratic tracts, but, at the same time, it is yearly becoming more so.

However, all this is merely a condition calling for a strong border, a good border armed police and mobile troops behind them, with a good establishment of transport. This, however, is not the only question. These same tribes are very numerous in the aggregate, and are more than well armed. Even the widow and the orphan invest their savings in the arms trade, to which Continental and even British merchants minister. They are liable, like all Moslem people, to waves of fanaticism. These waves have ever urged them to fling themselves at the nearest stations of the unbeliever. They, as well as the whole of Afghanistan, answer to this same call. In 1897, for some trivial cause, the temporal one perhaps that of discontent with a new salt cess levied on exports from our salt mines, the ecclesiastical ones, the fact of the Turkish successes over the Christian Greeks, brought on a frontier rising such as we had never seen before.

It began by what may have been an exceptional and detached incident, a treacherous attack on a political escort in Waziristan, in the middle of summer. Before the troops could return from straightening out this bother, the whole of Swat and Buner had swung themselves at an hour's notice against the British outpost on the Malakand.

In those days, troops were not permanently grouped in war brigades and divisions as now, and the spirit of war preparation was not so far developed, while the amount of available carriage was far short of that essential to the military protection of a border. There was, however, a well prepared and developed scheme of mobilization so far as possible under the existing conditions, and brigades were hurried up to relieve the Malakand and the Swat posts. But hardly could they get together before trouble commenced in the Kurram

and on the Samana, and then unexpectedly the fiery cross sped to the Mohmand border, and the tribes flocked down right into peaceful, cultivated India. Ere even the Mohmands could be scotched, the trouble had flown to the Afridi Tirah and the Khaiber region. So pressing was the trouble, that regiments and brigades coming up to the front in consequence of a regular process of mobilization and concentration were switched off north, south, east, and west to meet whatever trouble was for the moment most urgent. Generals and Staffs coming up to join their commands found them dissipated by urgent calls to all points of the frontier wherever need called, and road or rail could take them. Plans of course straightened out, and when border posts had been relieved and border tracts cleared of invaders, it was then possible to sit down and complete arrangements for exacting some reparation and some guarantee for the next few years.

Previous, of course, to 1897, indeed for close on a century, the march of political events, and the ever developing stream of trade with Central Asia, had forced us to what has been called the Forward Policy. It had meant quitting the Indus as our main line of frontier, with an advanced line at the base of the foot hills opposite, and securing for ourselves and civilization the main trade and military routes so far as they passed through tribal territory that was not properly part of Afghanistan. No doubt the presence of our troops and officials in the Khaiber and Kurram routes had stirred tribal opinions against us, but the condition was one that was a corollary of modern times and not for long to be avoided. The risings of 1897, and the uncertainty as to what the people of Afghanistan might do, or insist on their Government doing, which was later instanced in the attack on Landi Kotal in 1908, have given Government ample data on which to study the immediate defence of their north-west frontier. Combined with the principles of military organization, which have long actuated Continental governments, and now hold in the British Empire, the actual result as developed under Lord Kitchener's organization is as follows :—

At the entrance to the two great highways from Hindustan to Afghanistan and Central Asia stand two divisions of the Imperial Army. Between the two highways of the Khaiber and the Bolan Pishin road stand the three frontier brigades. Their duty is not to move up any of the great highways, but merely to cover the border and support the militia in times of peace, and in times of trouble to keep things in order while the field army is engaged elsewhere. They are kept at war strength and have a full war equipment, but do not belong to the disposable field army of India. Each of these brigades consists of a cavalry regiment, a mountain battery, and three battalions of infantry, all Indian, and

their commanders take orders direct from the Commander-in-Chief. They resemble in principle the coast defence troops of the United Kingdom, in being confined to the rôle of local defence and action.

Behind these immediately available divisions of the Army stands, of course, the remainder of the field army. After the events just described of 1897, it is no longer possible to leave the troops near the border unprepared, or without transport, and that this must be so the following brief outline of the tribes on the border will show. It must, however, be remembered that with every division facing to a definite part of the frontier, with separate lines of rail and road to move up by, the confusion of that year cannot arise again, even if the frontier rises in as erratic a manner.

Now the tribes along the 1,000 miles of border line that has been described may be divided into three classes: Those who are of non-Afghan descent, and who inhabit the hills near Gilgit and about the Indus and the slopes of the trans-Indus Kohistan; secondly, those who have, or who at any rate claim, Afghan and Israelitish descent; and thirdly, the Baluch tribes. For the most part it is the Afghan tribes with whom we are concerned. They stretch, speaking roughly, from the trans-Indus Kohistan to the Gomal Pass and the Zhob Valley. Commencing from the north, we have the mass of clans known as the Yusufzai, the sons of Joseph, who inhabit Swat and Buner, the Mohmand clans, and the Tarkanri tribes, all north of the Kabul River and the Khaiber Pass. Their detail of fighting men, all armed with firearms, mostly with Martinis, and many with magazine rifles (made in Birmingham, with "God bless the work" in gold inlaid Arabic letters on the lock), is as follows (the numbers are fighting men, unless otherwise stated):—

1. The Isazai clans of the Yusufzai, who mostly inhabit the Black Mountain and hills bordering the Indus in the north, 23,000 fighting men; less well armed, however, than the other clans.
2. The Yusufzai clans of Swat and Buner, 30,000 to 40,000.
3. The Tarkanri clans, in the small states of Dir and Bajaur and their neighbourhood, 30,000.
4. The trans-border Mohmand tribes, 20,000, and the Utman Khel, 37,000, who live in the hills immediately north of the Kabul River.

Between the Kabul and Kurram Rivers.

5. The small Mullagori and Shinwari clans who live around the Khaiber.
6. The eight great Afridi clans, who are so often spoken of that it will be well to give their names. They are the Kuki, Malikdin, Kambar, Kamar, Zakka, Sipah, Aka, and Adam

Khels. They total 40,000 fighting men, and with the exception of the latter, who live in the tongue of hills running out to the Indus south of Peshawur, all inhabit the Afridi Tirah south of the Khaiber.

7. Immediately south of the Afridis we have also the Orakzais, who inhabit the Samana and hills that lie on the north of the road from Kohat to Kurram. They number 25,000 fighting men. In the vicinity of this road are also several smaller clans: the Zaimukht (2,500), and the Chamkanni (3,000), while at the head of the Kurram are the Turis, some 6,000, whom we have long protected from the Afghans.
8. Within our own border, chiefly along the Indus in this portion of the frontier, are the Khattaks, 40,000, who enlist very freely in our regiments and armed police. The Bangash are also a small tribe in Miranzai, allied to the Khattak.

South of the Kurram.

9. South of the Kurram River we have the tribes of Waziristan and several small clans, who live within our administered border. The tribes of Waziristan consist of two main divisions, the Darwesh Khel and the Mahsud, having some 23,000 and 11,000 fighting men respectively. In addition to the lesser clans within our border, there are also, between the border and the two tribes above, the Dawaris in the Tochi Valley (6,700), and the Bhitannis (6,000), both of rather inferior material.

South of the Gomal.

10. South of the Gomal, in the mountains round the giant Throne of Solomon, are several small Pathan clans, of whom the Sherannis (3,000) are the largest and most tiresome. South of them, in the hills that fringe the Derajat, are various Baluch tribes.
11. Baluchistan itself is inhabited by Pathan, Baluch, and Brahui clans. A line drawn from the Vihoa Pass through Thal Chotiali and Quetta to the Gwazha Pass, is practically the dividing line, the Pathans lying to the north. The chief Pathan tribes are the Kakkar, the Tarins, and the Panis, who together number over 160,000 souls, and perhaps 30,000 to 40,000 fighting men. The Baluchis are divided into two main groups, termed Sarawan and Jhalawan, the former aggregating some 40,000 souls, and the latter 180,000 to 190,000 souls. The tribes of Baluchistan are not armed so well as others along the frontier, and for many years the feudal rule there has resulted in excellent behaviour

on their part. They are, however, in direct relation with the Agent to the Governor-General and not, as on the border adjoining the North-West Frontier Province, independent of regular control.

The foregoing describes briefly that great fringe of warlike high-land clans that edges our North-West Frontier. Clans who for centuries have sought their fortune in Hindustan and at the expense of their neighbours and of those who would pass through their hills. Many thousands of them seek service in our military and armed police forces, and not only make splendid soldiers, but do slowly absorb the leaven of civilization. Fortunes, however, do not come that way, as they came in the old days, and the leaven of civilization must take generations to permeate, while the pressure of life and inherited lawlessness mean that the general conditions on the border must remain much the same for many years to come.

Enough has, perhaps, been said to show why a large and well-prepared military force must remain close to the border, and why the Government of India maintains so much of its Army within reach of the north.

MAP OF NORTHERN INDIA

To accompany paper on N. W. Frontier





IV.

SOME DUTIES OF THE ROYAL GARRISON ARTILLERY IN WAR.

By CAPTAIN M. H. C. BIRD, R.G.A.

IT may be asked: "What need is there to discuss the duties of the Royal Garrison Artillery in war more than those of any other arm? It is an arm very much apart from the rest of the Army, so much so, that some of its members openly advocate handing it over to the Admiralty; its work has but little connection with that of the Army at large, and cannot be of great interest to it."

It is hoped that the following pages may show the need for such a discussion, and for some more definite steps being taken towards the preparation of the Royal Garrison Artillery for a part of its work which does not hitherto appear to have received all the attention which it deserves.

There are, at home and abroad (exclusive of India, which is not considered in this paper), the following units:—

34 garrison companies at home.

48 garrison companies (British) abroad.

3 siege companies at home.

6 heavy batteries at home.

The duties of the 85 companies on the Imperial Establishment appear, to the casual observer, to be summed up in the following extract from Field Service Regulations, Part I, Section 4 (9 and 10): "Siege artillery brigades may be allotted to the field army for special duties in connection with fortress operations. Garrison artillery companies are allotted to coast defences." Further investigation, however, indicates that the matter is not so simple as the above extract would lead one to believe. Chapter VIII, Field Service Regulations, deals with siege operations, and it is a matter for congratulation that this branch of warfare has been included in a training manual that is the common property of all arms of the service. Here we find, in Section 124 (1 and 6), the following references to technical branches:—

"The composition and strength of a force destined to undertake a regular siege must be adapted to the special work required of it. The proportion of cavalry may be less than in the field army, while that of artillery and engineers must be largely increased."

“ In the case of the artillery, the increase is effected by adding to the normal establishment of a field army a certain number of siege artillery units. This number will be determined by the requirements of each case.”

“ The duties of the technical branches of the service in siege warfare, which come more particularly into play during the advance on the front of attack from the line of investment to the position from which the assault is to be delivered, are dealt with in ‘Garrison Artillery Training, Vol. II,’ and ‘Military Engineering, Part II.’ ”

But Garrison Artillery Training is not a book that officers of other arms are likely to dip into. It gives the available force of siege artillery as follows :—

Page 1.—“(1) Siege batteries will not normally form part of an army in the field, but will, if required, be added as circumstances may demand.

“(2) The peace establishment of siege artillery comprises a siege artillery brigade of three garrison artillery companies, two of which are equipped with medium howitzers and one with heavy howitzers.

“ Each of the three companies forms the nucleus of two batteries which are organized for war as :

“ A heavy brigade of two heavy howitzer batteries.

“ A medium brigade of four medium howitzer batteries and two ammunition columns.”

This organization provides a force of eight heavy and sixteen medium howitzers, and it would be reasonable to assume that they could and would be mobilized with, or directly after, the Expeditionary Force, and would be available as soon as required. One might also suppose that this quantity would suffice to meet all possible needs, and it would be hardly worth while to bother much about the special duties of an arm amounting to only 24 pieces but for the following paragraph : Garrison Artillery Training, Vol. II, p. 2 (5) : “ The siege artillery may also be augmented by additional batteries of heavy guns, and by other medium howitzer batteries, manned by personnel detailed from the garrison artillery companies.” This arouses a faint suspicion in the mind of the reader that the two siege brigades may not always be quite enough. There is also a remark in Field Service Regulations, Part I, Section 124 (4) iv, about “ immense stores.”

One gathers from all this that some increase in the siege artillery brigades may possibly be required, and that a quantity of stores, of unspecified nature but “ immense,” will have to be brought up. What is not at all evident is that the increase may be from five to ten times the strength of the original two brigades, and that the stores required may amount to 1,400 tons daily, or more, for siege artillery ammunition alone.

As so startling an interpretation of the paragraphs quoted from our various regulations requires some support, some historical instances will be given, as well as the results of modern continental investigation and of siege staff tours held in England in recent years.

The following statement shows the nature and number of the ordnance employed in 1870 :—

Strassburg (Original Siege Train).

Heavy S.B. Mortars and 6-inch guns	...	108
" " 4 '7-inch guns	...	100
Light S.B. mortars and 3 '5-inch guns	...	80
Total	...	<u>288</u>

Paris (Original Siege Train).

Rifled guns, 8-inch and over	...	6
" 6-inch	...	59
" 4 '7-inch	...	84
" 3 '5-inch	...	40
" 6-inch Howitzers	...	15 (new pieces)
Smooth Bore Mortars	...	20
" Shell guns	...	20 (useless)
Total	...	<u>244</u>

Paris (North Front, attacked later).

Guns, 8-inch and over	...	3
" 6-inch	...	36
" 4 '7-inch	...	16
Howitzers, 6-inch	...	48
Total	...	<u>103 all rifled.</u>

The following table gives the Japanese siege train at Port Arthur :—

Port Arthur.

	22/8/04.	Change by 2/1/05.	Total.
Naval guns, 6-inch	0	+ 4	4
" 4 '7-inch	6	+ 4	10
" 12-pr.	18	+ 9	27
Bronze guns, 4 '7-inch	30	0	30
Krupp guns, 4 '2-inch	4	0	4
Howitzers, 6-inch	16	0	16
" 4 '7-inch	28	- 8	20
" 3 '5-inch	24	0	24
" 11-inch	0	+ 18	18
Mortars, 6-inch	72	0	72
Total	198	...	225

The land front of Port Arthur was short (only 12 miles) compared to the perimeter of modern Continental fortresses, and the foreground lent itself well to the establishment of siege batteries in concealed positions. The defences were of weak construction, without armour, and far more conspicuous than is usually the case, and the Russians had no heavy howitzers to speak of with which to meet the Japanese siege artillery. And yet the 225 pieces which the Japanese employed, in addition to their field artillery, only just sufficed.

Some years ago two Austrian officers, Macalik and Langer, brought out a book entitled "Der Kampf um Guertelfestungen," in which the requirements in guns, ammunition, personnel, and transport were most carefully worked out. Their estimate of what would be needed for the attack of a modern fortress may be summarized as follows:—

Mobile Siege Artillery, brought up with the	✓
Siege Army, corresponding to our Medium	
Brigade (6-inch Howitzers)	60
Siege Ordnance (not mobile), 4·7-inch gnns	32
" " 6-inch gnns...	48
" " 6-inch Howitzers	192
" " 9·45-inch Mortars	48
Total	<u>380</u>

The transport required to bring up this siege train complete with its first provision of ammunition, horse transport, artillery personnel, labourers, and three railway companies, was estimated at 79 trains of 100 axles each; for the second provision of ammunition 25 more trains were needed; while it was considered that an adequate rate of fire could be maintained by the whole of the 380 guns and howitzers if seven train loads of ammunition were brought up daily.

In 1907 a siege staff tour was held at Shoburyness, in which 92 guns and howitzers of various sorts were employed. The first supply of ammunition was estimated at 1,500 tons, and the daily requirements at 1,000 tons.

A second siege staff tour was held in 1908, when the number of guns was 168; the weight of the first supply of ammunition, 250 rounds per piece, irrespective of its nature, amounted to 3,000 tons, and with an average rate of fire of only 5 rounds per piece per hour the daily requirements worked out to 1,500 tons.

So much for the stores.

The strength of the Japanese siege artillery is not given in Part III of the "Official History of the Russo-Japanese War," but the 225 guns could have been manned by 28 of our heavy brigades, or say 392 officers and 11,172 men.

In the scheme worked out by Macalik and Langer it is estimated that each "Group" of 4 batteries (i.e., 16 pieces) will be manned by 1 battalion of 5 companies (including 1 for park duties), each company

having a strength of 4 officers and 170 men. In addition, each battalion would presumably have a staff of, say, 2 officers and 10 men, and as the battalions are grouped in regiments of 2 battalions, similar staffs will be needed for them also. There being 10 "Groups," there are 20 battalions or 100 companies, equal 400 officers and 17,000 men, 30 regimental and battalion staffs equal 60 officers and 300 men, making a total of 460 officers and 17,300 men.

In the 1907 staff tour the siege train was organized in 6 brigades, besides 3 heavy field artillery brigades; 4 of these had 16 6-inch howitzers each, and might therefore be classed as medium brigades. But according to present War Establishments, and the extracts already given, it is probable that only one of them would be so organized, the remainder being organized on the same lines as the heavy brigade. According to War Establishments and Garrison Artillery Training, Vol. II, a heavy brigade only mans 2 batteries or 8 guns, whilst a medium brigade mans 4 batteries or 16 guns; the requirements for this staff tour therefore work out as under :

1 medium brigade	} already provided for
1 heavy brigade	
6 brigades of 6-inch Howitzers	} i.e., 7 brigades, organized as heavy brigades, to be found by the R.G.A.
and	
1 heavy brigade	

In the 1908 staff tour there were 6 heavy brigades and 6 brigades of 6-inch howitzers (16 each). Calculating on the same lines as for the 1907 tour the requirements were :—

1 medium brigade	} already provided for
1 heavy brigade	
10 brigades of 6-inch Howitzers	} i.e., 15 brigades, organized as heavy brigades, to be found by the R.G.A.
and	
5 heavy brigades	

The following table gives a recapitulation of the most recent practical and theoretical experience :—

Occasion.	Guns.	Officers and Men.	Remarks.
Port Arthur	225	28 brigades = 11,564	104 trains for men and stores, including second supply of ammunition, 7 trains daily.
Macalik and Langer ...	380	17,760 = 44 brigades (about)	
1907 Staff Tour	92	7 brigades = 2,891	First supply 1,500 tons, 1,000 tons daily.
1908 Staff Tour	168	15 brigades = 5,985	First supply 3,000 tons, 1,500 tons daily.

It should be noted, however, in connection with the two staff tours that according to Garrison Artillery Training, Vol. II, p. 156, para. 11,

special arrangements for the ammunition details of the heavy brigades will have to be made on mobilization, which would, on the basis of Macalik and Langer's calculations, amount to an extra 800 men for the 1907 tour, and 1,200 men for that of 1908.

RESOURCES AVAILABLE.

To meet our immediate requirements of two siege brigades we have in England a siege brigade with a peace establishment of 20 officers and 582 non-commissioned officers and men. Its war establishment being 46 officers and 1,562 non-commissioned officers and men (without attached), there are 26 officers and 980 non-commissioned officers and men to be found on mobilization.

With 8 years' colour service it may be assumed that 73 men join the Reserve annually, and with 4 years' reserve service, and allowing for 5 per cent. waste per annum, the strength of the reserve supplied by the siege brigade serving at home cannot be much more than 270, leaving 710 to be provided from other sources. A certain number of men belonging to the garrison companies at home are put through a course of siege work at Lydd annually, but these are selected men, and establishments in coast defences being what they are, it is conceivable they could not be spared to join the siege brigade.

There are, however, in India 6 heavy batteries and 2 siege companies, with a total establishment of 822, which may be taken as providing a reserve of 380, calculated as above. Supposing that this is not wanted for India, it would be available to fill up the home siege brigade, leaving a deficiency of 330; but a considerable number of the garrison companies in India are trained as heavy batteries, and many of those in the colonies are trained to work the movable armament, consisting of heavy field guns and howitzers, and it seems probable that the reservists supplied by these would suffice to make up the remaining 330 required.

The successful mobilization of the two siege brigades required for first use appears therefore to depend, as far as non-commissioned officers and men are concerned, upon the arrangements made by the Royal Artillery Record Office for keeping careful lists of the reservists from siege and heavy companies and for recording their qualifications as layers, telephonists, and observers, in considerable detail. If this is not done, the addition of 170 per cent. to the peace establishment must cause extraordinary confusion.

The 26 officers will have to be found from the Royal Garrison Artillery companies at home, which will cause considerable strain. A number of them, also, are put through siege courses every year, but owing to the annual reliefs in addition to continual changes caused by promotion, &c., it must be difficult to keep the lists of trained officers up to date. On the outbreak of war, all the available

officers will be urgently needed in the coast defences, for which they only just suffice as it is; the supplementary list of the Special Reserve hardly exists as yet, even in the Army List, and there are no special reserve units of Royal Garrison Artillery available to draw from, those in Ireland being already told off to coast defences. How soon the Territorial officers would be fit to take the place of Regulars it is hard to say, and it seems unlikely that they could easily be spared.

For any augmentation of the siege artillery first sent out the Royal Garrison Artillery companies at home must be drawn on, as laid down in the regulations already quoted. The non-commissioned officers and men on the peace establishment of companies at home and in the reserve, but exclusive of the six heavy batteries, the siege brigades, and the reservists required for them, amount to some 9,000 odd, or enough for some 23 heavy brigades, but the number of officers is apparently only just enough for 15. This leaves nothing over for extra requirements on the lines of communication, or at the advanced base, which would almost certainly be necessary to help with the large quantities of extra stores.

To carry out a siege of only moderate dimensions would, therefore, use up the whole of the Royal Garrison Artillery at home, and would leave no reserve behind to fill up casualties.

NEED FOR PREPARATION FOR SIEGE WORK.

Before inquiring into the nature and extent of the preparation given to and required by the Royal Garrison Artillery to fit it to undertake the task outlined above, it seems desirable to meet the possible objection that such duties are never likely to be required of it, and that therefore no preparation is necessary.

In the first place, the mere fact that a chapter on siege operations is included in the Field Service Regulations, shows that those responsible for the training of the Army in peace, and for its employment in war, consider it possible that it may have to take part in them, and therefore intend that all officers shall make themselves acquainted with their special characteristics.

Any campaign on the continent of Europe would probably involve siege operations on a considerable scale, for the purpose of securing river crossings, opening railway lines, protecting the lines of communication against interference, guarding one's own flank, or threatening that of the enemy.

That a siege, when once it is decided upon, must be pushed with energy and not be allowed to drag on, may be a truism, but the principle cannot be acted on unless adequate preparation is made. Both in 1870, and in the Russo-Japanese War, the dangers that arise through insufficient preparation for siege operations were made manifest again and again.

It may be that a siege may not be quite to our taste, and that any success we may attain in that direction will not bring in so much glory as operations in the field. But circumstances may compel us to undertake a siege, and we should be ready to do so.

PRESENT PREPARATION AND SUGGESTIONS FOR IMPROVEMENT.

The amount of preparation which the Royal Garrison Artillery undergoes to fit it for siege operations is perhaps more than is generally realized, although in various ways it might be made more thorough and more definite in intention. Garrison Artillery Training, Vol. I, Section 12, lays down that all companies must be trained with movable armament and instructed in siege artillery methods. In Section 7 it is stated that officers undergo courses in siege work at Lydd. Section 5 insists on the need for training officers for duties when serving with an army in the field, in movable armament, and in siege artillery methods, and it further directs that they shall be given reconnaissance work in connection with the employment of the guns of the movable armament.

The instructions for practice, Royal Garrison Artillery, lay down certain practices to be carried out by Royal Garrison Artillery companies that are allotted to movable armament on mobilization, and, so far as is known without looking into defence schemes, most, if not all, of the companies stationed abroad are trained with movable armament, consisting of howitzers, heavy guns, or field guns. Indeed, so well is it recognized that the coast defences have in the past, as a rule, succumbed to land attack only, that the thoroughness of the training, and the efficiency of the companies, has steadily increased from year to year.

It is also unfortunate that, in some stations, conditions of ground and space are such as to render training very difficult, whilst practice has often to be carried out at targets in the sea. This last condition is, in some cases, impossible to rectify, but it need hardly be pointed out how much is lost by it.

It is evident, therefore, that the proficiency of the Royal Garrison Artillery in siege work is a very variable quantity, and is apparently at its lowest in the companies stationed at home—the very ones that will have to be used to form the siege train when we require it.

These defects might be minimized, to a great extent, by increasing the allowance of ammunition, and by making all companies practice with movable armament, whether allotted to it on mobilization or not. Land ranges, especially for long range guns like 4·7-inch, are difficult to find, but something would be gained if practice could be carried out across bays and inlets on to uninhabited promontories, or even islands, instead of at targets floating in the sea, a proceeding for which neither the ordnance nor the instruments used with it are

designed. What could be done in this way can, of course, only be discovered by reconnaissance on the spot. It might also be possible to get people to move out for one day at a time, without incurring too heavy a charge for compensation, and so avoid the prohibitive expense of buying, or even hiring, land ranges near every fortress, or the need for sending many companies to distant and overcrowded practice camps by rail.

It is suggested that a section should be inserted in Garrison Artillery Training pointing out that should the Expeditionary Force be despatched abroad, it probably would be necessary to undertake siege operations involving the employment of the bulk of the Royal Garrison Artillery stationed at home; that it is imperative that the Royal Garrison Artillery should be prepared to undertake the working of the siege train required for this purpose; and that, therefore, all companies must be trained to siege work as a duty second only in importance to coast defence.

The division of the regiment into field and garrison branches was essential to the efficiency of the garrison branch, and, in that respect, has proved its soundness up to the hilt—but the Royal Garrison Artillery has suffered from the defensive spirit ever since. It spends its time waiting for an enemy who may never come, whose coming, indeed, the defences are expressly designed to prevent, and who, therefore, very likely never will come unless reasons of strategy compel him, as with the Japanese at Port Arthur. Troops trained in such an atmosphere are bound to deteriorate; and the monotony of looking at and shooting into the same patch of sea for five years on end, with nothing else to look forward to, needs to be experienced before it can be fully realized. The prospect of going out to look for the enemy, if he will not come to you, is necessary to stimulate keenness and hope.

In the matter of organization also, the defensive idea predominates, to the complete exclusion of any other. The present system, according to which reliefs are carried out by drafts, instead of whole companies, and the companies are of varying establishments, was devised to meet the difficulties caused by the arrival in a station of new companies which were complete strangers to it, and by the different strengths required to suit local conditions. The advantages are, of course, obvious, but they benefit and tend to emphasize the defensive side of Royal Garrison Artillery work only. The companies have become entirely sedentary, with nothing at all to hint at any offensive rôle. Other disadvantages which have followed from an excessive extension of localization in some cases, without being actually unavoidable consequences of it, hardly come within the scope of this paper, and can be remedied by those responsible for the training of the Royal Garrison Artillery. For siege work, units must be of equal strength, since they each man the same number of guns. This

can be arranged by varying the number of reservists allotted to each, whilst a few specially strong companies may have to hand over complete sections to the weakest, to prevent them being utterly swamped by reservists. This is clear from the fact that peace establishments at home vary from 92 to 236 of all ranks. It is suggested that some readjustment might be possible without excessive expense; it is an important matter, since, without a certain establishment, the necessary specialists, who need continuous training and practice in ever-changing methods, cannot be maintained. No further changes in the present organization of Royal Garrison Artillery companies seem essential.

In order to overcome the difficulty of finding the extra officers required for the existing siege brigade, it is suggested that the lieutenant-colonel commanding should be made responsible for obtaining supplementary Special Reserve officers for it; at present, it is nobody's business, as coast defence commanders, who are now responsible, will naturally try to get officers for coast defence work, and the siege companies are not under them except to a limited extent. As it is, the Army List at present only contains the names of 16 supplementary reserve officers all told. It would also appear desirable to raise the peace establishment of the siege companies, as an influx of 170 per cent. of reservists is more than any unit can stand without a good deal of disturbance.

In order to increase the number of Royal Garrison Artillery available, so as to be able to replace casualties, and to undertake a siege of more considerable dimensions than is now possible, Section D of the Army Reserve might be thrown open to the Royal Garrison Artillery to a greater extent than it is. The work required can be performed by older men than are perhaps desirable as infantry reservists. Another 3,000 would put the siege train on a fairly satisfactory footing. What is more important, however, is the supply of officers, and no effort should be spared to obtain supplementary Special Reserve officers, as long as the requirements of the field army are not unduly interfered with.

It is further suggested that a new section should be added to Field Service Regulations, Chapter VIII, discussing the influence of fortresses on field operations, the reasons why they exist, and the circumstances which may consequently render their capture necessary. It is submitted that, if other objects besides the one mentioned in Section 116 (2) for the construction of fortresses were set forth, it would make it plain that the question of attacking them is very much less a matter of choice than the chapter, in its present form, would lead one to suppose.

Finally, in this connection, it is desirable that siege staff tours should not be left entirely to the technical branches of the service. The inclusion of Chapter VIII is a step in the right direction, the

necessity for which is abundantly proved by the events of 1870 and the Russo-Japanese War. The next step should be to bring siege staff tours into intimate connection with field operations by introducing them into the scope of staff tours on a large scale, or Army manœuvres. In any case, after due general consideration of the technical problems involved, the General Staff should undertake the conduct of siege staff tours themselves, leaving to the technical branches only the actual technical details of the work. In this way we shall arrive at a clearer idea of the problems that may confront us, and have a fair chance of coming to a satisfactory conclusion as to the extent to which our preparations for siege warfare should go.

V.

AUTOMATIC RIFLES.

AN automatic rifle is one in which the operation of opening and closing the bolt, with the resulting extraction and ejection of the empty case, and its replacement by a fresh cartridge, are performed automatically. The firer is thus relieved from any manipulation of the bolt, except perhaps the closing of it after charging the magazine, and is only concerned with replenishing the magazine, taking aim, and pressing the trigger.

The automatic action is obtained in two ways. In one type of weapon a vent is bored through the barrel near the muzzle. This vent leads into a cylinder in which works a piston, whose backward movement is communicated by means of a connecting rod to the bolt, unlocking it, and forcing it to the rear. This action is due to the pressure of the gas, which passes through the vent immediately the base of the bullet is clear of it. A weapon of this type is therefore known as a *gas-operated rifle*.

In the other type the effect is produced by utilising the recoil, and the rifle is thus termed a *recoil-operated* weapon.

In both cases the backward movement of the bolt compresses a spring which eventually reasserts itself and drives the bolt forward.

Rifles of either group are also classed as *self-firers* or *self-loaders* according to whether the rifle fires automatically so long as pressure is kept on the trigger, or whether a separate pressure of the trigger is required for each shot. It is clear that with the self-firer the pause between the shots is not sufficiently long for aim to be taken, and that the fire from it is therefore unaimed fire. No nation would consider such a rifle, and no true hand-weapon of this kind is now made, though the principle is of course in use in rifle-calibre machine guns, and in portable machine guns of the Rexer and Chauchat types.

The advantages to be gained by the use of an automatic rifle follow on the definition of it given at the beginning of this article. The first and most obvious one is the increase in the rate of fire which can be attained without the prolonged training in the manipulation of the bolt which is necessary with a magazine rifle. A commander thus possesses a large reserve of fire power, and, in the defence, when economy of ammunition need presumably not be very closely studied, he will be able to deceive the enemy as to the strength in which a

position is held. Further, there is the saving of fatigue to the firer consequent on the elimination of the motions of opening and closing the bolt, and of lowering and raising the rifle after each shot. Of these, the latter economy is the greater, but, as the Lee-Enfield rifle can be loaded without removing it from the shoulder, the automatic rifle is no gain to us in this respect. Fatigue is further lessened by the absorption of the recoil, which disappears entirely in a recoil-operated rifle, and to a large extent in a gas-operated one. Finally, as the only necessary movement of the firer is that which takes place during the charging of the magazine, his visibility will be diminished owing to his comparative immobility.

On the face of it these advantages are very considerable, and would appear to outweigh a small increase in delicacy of the mechanism or any other small disadvantage. Discussion of the subject in the Press and in magazine articles, both British and foreign, usually stops short at this point, perhaps adding data as to the rate and duration of fire possible, which are wholly misleading.

But, if investigation is carried further, a number of adverse points appear, and it is proposed to deal with these points *seriatim*. They will be found to cover mechanism, manufacture, and maintenance, as well as questions of training and tactics.

In addition to the faults common to both, which are detailed later on, each group has its peculiar defects. In the case of gas-operated rifles the vent is liable to erosion from the rush of gas through it, while the cylinder is apt to become choked with hard fouling. The latter difficulty is hard to cope with, as the cylinder is not easily removable, and the remedying of any defect in it generally entails the separation of the barrel from the stock.

In the recoil-operated rifle the recoil of the barrel introduces an undesirable feature. It is necessary that before the breech is unlocked the bullet shall have left the muzzle, and the pressure in the bore have fallen to atmospheric pressure. Barrel and bolt have therefore to recoil as one part for a certain time before separating, and the backward travel of the barrel during the forward travel of the bullet is calculated to upset the ballistics of the rifle. Again, during its recoil and forward movement, the barrel must move in bearings, and if the bearings get worn, as they must do in practice, they fail to guide the barrel properly, and the rifle loses its accuracy. Finally, the necessity for forcing the barrel forward again after the bolt is separated from it entails the introduction of another spring.

The consideration of both types shows that they are of necessity very much more complicated than the magazine rifle, and, as a consequence, more expensive and more delicate. The complications largely consist of springs, which are not easy to manufacture, as the nature of the mechanism is such that the limits on either side of the normal, within which their strength must lie, are very small. They

are also inclined to prove unreliable in use, and their replacement in some instances requires the knowledge of a skilled mechanic.

It is clear that, in order to reduce as far as possible the jar, which is likely to loosen the mechanism, the balance between the force of recoil of the bolt and the strength of the bolt-return spring must be somewhat nicely adjusted. This being so, it is apparent that any extra friction introduced by dirt or rust is a possible cause of breakdown. The question of ammunition also is affected by this point. If the cases are slightly soft, so that after firing they are unusually tightly moulded to the chamber, or if they are tight before firing, the same condition of excessive friction will be reproduced, while if, owing to slight variations in the weight of the charge, the recoil varies from round to round, there may, at all events with a recoil-operated rifle, be failure to overcome sufficiently the resistance of the bolt-return spring, and the bolt will not be forced far enough back to engage behind the fresh cartridge. This points to a probable necessity for closer gauging and inspection of the ammunition, and a consequent large increase in the expense of providing it.

The bolt mechanism must be of the straight-pull type, and primary extraction is therefore weak and liable to fail.

The necessity for housing the springs and rods of the mechanism in the woodwork of the stock must lead to a weakening of the fore-end. As the strength of the latter is of vital importance in connection with the use of the bayonet, any weakening of it introduces dangerous possibilities.

In several of the rifles which have been brought to notice recently it is found that the over-tightening of certain screws is sufficient to disorganize the mechanism, while in others the removal of the pressure on the trigger must take place at a certain definite period in order to admit of the action being cocked for the next shot. Though these points are not of universal application, they show on what very minute details the proper functioning of the automatic action depends, and in all cases experiment has made it clear that the slightest deviation from the correct timing of the various phases of the action leads to breakdown.

Enough has been said to show that an automatic rifle requires for its reliable working conditions which are nearly impossible on service, while it is probable that repairs could not be carried out in the field with anything approaching the ease with which defects in the less complicated magazine rifle can be dealt with. The inevitable result would be that a considerably augmented reserve of rifles would have to be available in the field, with either a consequent increase in the amount of transport, or a reduction in the amount of some store of almost equal importance. Manufacture, too, would present greater difficulties, and involve increased expense, while the treatment of the rifle, even in peace time, by careless or ignorant men, would be a constant source of anxiety to officers.

In considering the bearing of the automatic rifle on tactical questions, it is necessary to have a definite idea of its capabilities as regards duration and rate of fire. The duration is limited by the heating of the barrel, and the rapidity with which this heating takes place depends on the rate at which the rifle is fired. It is found that a Lee-Enfield rifle which is fired continuously for seven minutes, during which some 110 rounds are expended, is thereby made practically useless owing to heated air from the barrel, and smoke from the charring woodwork, rising and affecting the aim, to the exudation of boiling oil making it impossible to handle the rifle, and to difficulty in extraction. The rifle cools and regains its efficiency after a length of time which is dependent on the temperature of the atmosphere, though of course the constant repetition of the performance would lead to the destruction of the interior of the barrel. It would not, in action, be possible to count on the time required for cooling, and it is necessary, therefore, to stop considerably short of the point at which the rifle becomes temporarily useless. Bearing in mind that, in the present state of knowledge, no cooling device, except perhaps the partially effective one of a barrel-casing, is available, it may be said that 60 rounds at the maximum rate is the greatest possible duration of continuous fire in a temperate climate. Taking into account the time necessarily spent in recharging the magazine and in taking aim, the utmost rate which a highly trained man can attain at short range will not exceed 30 rounds per minute, and for the ordinary rank and file, 20 rounds may be regarded as a probable maximum, the average maximum with the present magazine rifle being from 13 to 14 rounds a minute. The rate might be slightly increased if a larger magazine were used, but such a device would be cumbersome, while the necessity for charging the magazine after every five rounds tends to steady the firer, and is, in that respect, an advantage.

The transition to the consideration of the expenditure of ammunition is a natural one. It is probable that with a high standard of training the waste of ammunition would be not much, if at all, greater than with the magazine rifle. Unfortunately, the tendency to waste will mainly show itself at close quarters, when control by the fire unit commander has become impossible, and when the man can see individual targets in the enemy's lines. It is very doubtful whether training can be carried to a pitch which will neutralize this effect of nerve tension, and the waste will occur at a time when the supply of ammunition to the firing line will probably be impossible, except under cover of darkness. It is said that this objection was raised on the substitution of a magazine rifle for a single-loader, and that as it was not valid then, it is not valid in connection with an automatic rifle. The analogy is not, however, complete, for it was not realized to what an extent the manipulation of the bolt would

prevent a very high rate of fire, particularly at the shorter ranges towards the close of an action when the men are fatigued and the rifles hot. With an automatic rifle this safeguard disappears. As a check on the tendency to use an unduly high rate of fire, it has been proposed to provide a cut-out, which will prevent the rifle being used as an automatic, and convert it for the time into a magazine rifle. Such a device, however, when in use, removes at once all the peculiar advantages of the automatic rifle, and introduces the objection that automatic fire is not available in an emergency until the cut-out is removed, an operation which might well be overlooked by excited men.

An enquiry into the matter of training brings to light one of the most potent objections to the system. As the automatic action will not work except with ball cartridge, training in that use of the rifle will be confined to the totally inadequate number of rounds which can be allotted to it in the annual course. It might be possible to provide a muzzle attachment which would enable blank cartridge to be used, but such a device would add to the cost, and be undesirable in other respects. It would thus be impossible to give a man a true idea of the powers of his rifle, or to train him in the selection of targets which would justify the use of the maximum rate of fire.

Again, targets which would justify the expenditure of ammunition at the rate of 20 or more rounds a minute must be exceedingly rare in a modern battle. Apart from the deception in the defence already mentioned, charging cavalry, or troops surprised in close formation, are possibly the only instances in which effect, proportionate to the sacrifice of ammunition could be expected. This goes to prove that with ideal training a much larger expenditure of ammunition than under present conditions need not be expected, but it also raises a doubt as to whether it is reasonable to adopt a delicate weapon when opportunities for its fullest use must be infrequent.

In order to avoid difficulties of training on a large scale, it is often proposed that automatic rifles should be issued to a proportion only of each unit, the remainder being equipped with a magazine rifle. The men selected would presumably be the pick of the unit, but, as it would be necessary to train other men to fit them to take over the automatic rifles in the event of their proper owners becoming casualties, and as these men would also have to be trained in the use of the magazine rifle as their normal equipment, an anomaly would be presented, in that the less expert men would have to be more highly trained than the more expert. In addition to this, the undesirability of having two types of weapon in use in one service is obvious.

It may then be said with certainty that the solution of the mechanical problem is not in sight, while it may equally be said that, even if the mechanical difficulties can be overcome, a survey of the situation as it affects training and tactics must raise grave doubts as to the advisability of adopting the automatic principle.

VI. THE SOLDIER'S DIET.

By MAJOR NEILL MALCOLM, D.S.O., Argyll and Sutherland
Highlanders.

“**T**O be successful in war,” said the Emperor Napoleon, “it is necessary that an army should be able to march 3 leagues, fight a battle, and march 3 leagues in pursuit.” That is to say that, in the opinion of the greatest of all soldiers, an army could not reap the full effect of its victories unless its individual members had attained an extremely high standard of physical fitness. To-day, when the duration of battles is reckoned in days instead of in hours, this power of endurance is more important than ever it was. The man who can march and fight for 24 hours is worth two men who are exhausted at the end of 12 hours only; and it is impossible to read any detailed account of the Russo-Japanese War without coming to the conclusion that the Japanese owed much of their success to their amazing staying power. For an army like ours, it is doubly important to study every detail that can compensate in the smallest degree for numerical weakness. Skill in shooting, training, and mobility are, if possible, of greater importance to us than to any other army; and the basis of all, so far as the rank and file are concerned, is physical fitness. It is, therefore, permissible to ask if we are doing everything in our power to ensure that, when the day comes, our men shall be not only as capable of supporting fatigue as the enemy, but also as fit as they can possibly be made. If we are not doing all that we might, then we are neglecting something which Napoleon considered to be one of the principal conditions of success, and which has probably become even more vital in the last 20 or 30 years.

To develop the physical powers to the greatest possible extent—and nothing less should satisfy us—three things are necessary: good food, fresh air, and exercise. Each of these factors has received a great deal of attention during recent years. The housing of the soldier in modern barracks is far better than it was even ten years ago; an article on cross-country running which appeared in the first
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number of THE ARMY REVIEW shows how much attention is being paid to scientific exercise; and frequent memoranda upon the management of cook-houses and upon kindred subjects show that the soldier's food is not neglected. It is, however, to the last of these three points that I would, with all humility, draw particular attention in this article.

Let me preface my remarks by saying that I do not propose that subaltern officers should attend cooking classes, nor that the English alphabet should be extended in order to provide a suitable classification for further subjects in the promotion examinations. It is a matter in which we must depend for guidance upon our experts; but, at the same time, the regimental officer may do much, and the best results can only be attained by co-operation. I know, of course, that the officers of the Royal Army Medical Corps have devoted a very great deal of study to the proper feeding of the fighting man; and that Colonel Melville, in particular, recently conducted some important investigations into the relations between the soldier's food and his power of doing continuous work under something resembling active service conditions. Nevertheless, it does not appear to me, as a company officer, that the results obtained from all this valuable work have really been translated into terms of the soldier's daily life in barracks. Our medical officers do their best; our company officers do their best; but the tendency is to work in isolation. That, at least, is my impression.

Writing as a regimental officer for regimental officers, I may perhaps be permitted to explain that the value of food, as well as energy expended, is expressed in units known as "calories." It has been established that to keep himself in proper condition the British working man should consume 3,500 calories per diem. The labour of the private soldier is not, on the average, so strenuous as that of the working man, and in ordinary times he should be kept in health on a diet producing about 3,200 calories a day. Here we have a "standard test" of the value of the soldier's food.

Almost equally important, especially when money is limited, is the proper composition of the food supplied, and in this connection the following letter, with which I have been favoured by Mr. Noel Paton, Professor of Physiology at Glasgow University, is of great interest:—

"You may take it that the 3,500 calories may be best supplied in 110 to 120 grams of protein,¹ about 500 grams of carbohydrate,² and about 100 grams of fats. If heavier work is to be done, the various constituents of the food should be increased in about the same proportions. Carbo-hydrates are the cheapest and

¹ i.e., speaking generally—meat, fish, eggs, &c.

² i.e., starch-containing substances, bread, vegetables, sugar in all its forms, &c.

most available forms of energy supply; but the digestive organs are apt to kick against much over 500 grams—yielding 2,050 calories. About 100 grams of fats are usually comfortably digested—yielding 930 calories, and 120 grams of proteins will make up the 500 calories or so still required, and will make good the wear and tear of nitrogenous (living) tissues.

“In America, in the case of lumbermen and those leading an active out-door life, the digestive organs can deal with much greater amounts. One of the difficulties in increasing the work-doing power of our urban population is the feeble condition of the digestion, which limits the capacity to take in a supply of energy in food.”

Here we have a second “standard test,” by the light of which it is possible to examine the soldier's food.

Every regimental officer in the Army is familiar with the company or half-battalion “diet sheet” which is brought up weekly for signature by the commanding officer. Now I would ask, again with all humility, what those diet sheets are supposed to convey to the man who is called upon to examine them? I submit that, unless he is a trained physiologist with a well-equipped laboratory and an efficient staff, his signature is valueless. The only man who can really tell whether the diet is satisfactory, and whether the extra messing money is being laid out to the best advantage, is the medical officer, and even he should be in touch with some well-equipped centre where facilities for analysis are greater than is possible in the average station.

From mere curiosity I submitted certain of these diet sheets to Professor Noel Paton, who was kind enough to have them examined and the results carefully tabulated by Miss Lindsay, a highly-skilled member of his staff. Four successive days were chosen, and the tables submitted for examination were as follows:—

Day.	Breakfast.	Dinner.	Tea.
<i>Sunday.</i>			
56 men in Mess. Amount spent in extra messing, 12s. 10½d.	20 lbs. haddocks 2½ lbs. sugar 10 ozs. tea 28 lbs. bread 2½ pints milk	42 lbs. meat with bone 49 lbs. potatoes 8 lbs. cabbage, car- rots and onions 56 pints soup 3 lbs. barley 2 lbs. salt	28 lbs. bread 6 lbs. jam 10 ozs. tea 2½ lbs. sugar 2½ pints milk
<i>Monday.</i>			
56 men in Mess. Amount spent in extra messing, 15s. 10d.	11½ lbs. sausages 2½ lbs. sugar 28 lbs. bread 10 ozs. tea 2½ pints milk	42 lbs. meat with bone 49 lbs. potatoes 8 lbs. cabbage, car- rots and onions 56 pints soup 3 lbs. barley 2 lbs. salt	3½ lbs. butter 2½ lbs. sugar 28 lbs. bread 10 ozs. tea 2½ pints milk

Day.	Breakfast.	Dinner.	Tea.
<i>Tuesday.</i> 49 men in Mess. Amount spent in extra messing, 14s. 5d.	37 pairs kippers 2 lbs. sugar 8 ozs. tea 2 pints milk 24½ lbs. bread	36½ lbs. meat with bone 42 lbs. potatoes 6 lbs. carrots, onions and turnips 7 lbs. flour 2 lbs. salt 2 lbs. barley 49 pints soup	3½ lbs. butter 2 lbs. sugar 8 ozs. tea 2 pints milk 24½ lbs. bread
<i>Wednesday.</i> 56 men in Mess. Amount ex- pended in extra messing, 13s. 11d.	10½ lbs. mince 4 lbs. onions 2 lbs. flour 28 lbs. bread 2 lbs. sugar 6 ozs. tea 2½ pints milk	42 lbs. meat with bone 49 lbs. potatoes 8 lbs. turnips, cab- bage and onions 2 lbs. barley 56 pints soup 2 lbs. salt	8 lbs. syrup 3 lbs. sugar 6 ozs. tea. 28 lbs. bread 2½ pints milk

It is not necessary to do more here than to summarize Miss Lindsay's calculations, which showed that the food consumed per man worked out as follows:—

		Protein.	Fat.	Carbo- hydrate.	Total Calories.
1st day ...	Grams Energy in calories ...	148 606·8	78 725·4	406 1664·6	2996·8
2nd day...	Grams Energy in calories ...	127·7 523·6	131·8 1225·7	365·5 1498·5	3247·8
3rd day...	Grams Energy in calories ...	154 631·4	109 1013·7	405 1660·5	3305·6
4th day...	Grams Energy in calories ...	139 579·9	92 874·2	427 1750·7	3204·8

Let us now examine these results by the light of our two standard tests. In the first place, the total calories consumed per man in the four days was 12,755, giving a daily average of 3,188. This is very nearly equal to the amount laid down as requisite, and it may therefore be said that the men were sufficiently fed except on the first day when there was a want of fat, owing to fish being substituted for meat at breakfast, and the deficiency not being made up in other ways. Additional testimony to this effect is afforded by the fact that the men were not losing weight.³

³ This, however, might be due to suppers, &c., provided by the men at their own expense.

When, however, we examine the proportion of energy provided by the different ingredients, it becomes apparent that it is being supplied in the most expensive form, and that a deficiency of cheap carbohydrates is made good by an excess of dear proteins. In Professor Noel Paton's ideal diet the calories are supplied in the following proportions: one-seventh from proteins, two-sevenths from fat, four-sevenths from carbo-hydrates. Of the 12,755 calories consumed per man in the four days, that would give us 1,822 from proteins, 3,644 from fats, 7,288 from carbo-hydrates, instead of which the figures which we actually get are 2,341 from proteins, 3,839 from fats, 6,574 from carbo-hydrates. Evidently, therefore, our money is not being laid out to the best advantage, and more energy might be provided for the same expenditure. A few analysis sheets showing the energy-values of different forms of food, such as could be obtained from any physiological laboratory, would be a great help in this direction.

On moving into camp the error becomes still more apparent, for then the Government ration of meat is increased by $\frac{1}{4}$ lb. daily, and the disproportion between proteins and carbo-hydrates is accentuated. In other words, the waste is greater than before. The remedy is obvious.

Let us take one final example. During the past training season certain companies went on what has come to be known as "company trek." For the four days during which they were out, the profits derived from the sale of beer were applied to the improvement of the messing, and a further contribution was made from other funds. As the result, the men were extremely well fed, and the commissariat arrangements were pronounced on all hands to have been a success. Scientific analysis told a somewhat different tale. Again the full details of the daily diet may be omitted, but it was found that the approximate amount of food consumed per man per day worked out at⁴—

Sugar	...	...	...	...	...	2	ozs.
Tea	...	...	...	...	...	$\frac{1}{2}$	oz.
Bread	...	...	...	...	...	$1\frac{1}{2}$	lbs.
Meat of all sorts (including eggs and fish)	...	...	...	...	...	$1\frac{1}{4}$	lbs.
Potatoes	...	...	...	...	...	1	lb.
Vegetables	...	...	...	...	...	2	ozs.
Butter	...	...	...	...	...	2	ozs.
Condensed milk	...	...	...	...	...	8	ozs.

During three complete days' absence from headquarters the quantity of food supplied for each man was found to be: proteins, 481 grams; fats, 571.4 grams; carbo-hydrates, 1,563.2 grams, the whole possessing an energy-value of 14,020.4 calories, or 4,673.5

⁴ The figures are for three days only. The companies returned to camp for dinners on the fourth day and again came on battalion messing.

calories per man per day. In the course of the experiments referred to at the beginning of this article, Colonel Melville found that the energy expended per man per day amounted to just over 4,000 calories. During "company trek" the work appears to have been about the same, but it was kept up for a shorter period. Instead, therefore, of the commissariat being successful, it was wasteful and expensive. Not only was the total amount of food in excess of the requirements of health, but, as before, it was supplied in an unscientific proportion. Of the 14,000 calories per man it was found that 2,300 were derived from the proteins, 5,300 from the fats, 6,400 only from the carbo-hydrates. A reference to Professor Noel Paton's letter and a very simple calculation will be sufficient to demonstrate the error.

The point need not be laboured. The amount of money available for the feeding of the soldier is strictly limited, and it must be applied to the very best advantage if we are to have our men in that state of physical fitness which Napoleon considered necessary to success in war. To do this, I submit that there should be closer co-operation between the regimental officer and the scientific branches of the services. A committee, even when comprising the second in command and the sergeant cook, cannot be the repository of all wisdom; and, even with the aid of a bread-slicer and a potato-peeler, they may be guilty of waste. The fault is one which runs through many phases of our national life. In this country there is no lack of scientific research; but, between the laboratory and the practical application of the results obtained there, a great gulf has been fixed.

VII.

MEMORANDUM ON ARMY TRAINING IN INDIA, 1910-11.¹

1.—TRAINING CARRIED OUT IN 1910-11.

(a) *INDIVIDUAL training.*—During the year the individual training of officers, non-commissioned officers, and men was generally carried out in accordance with Chapter II, Training and Manœuvre Regulations, and received on the whole very thorough attention. The system of regimental exercises there introduced has not yet however been fully taken up in all units. The value of these exercises cannot well be overrated, since by their means a very much higher standard of tactical skill among regimental officers is likely to be attained. General officers commanding, and their general staff officers, will therefore afford every assistance in their power to commanding officers in arranging for them.

(b) *Collective training.*²—Except as stated below the funds available only allowed of collective training being carried as far as “*cavalry and infantry brigade and divisional artillery training.*” Practice in the combined action of the three was, however, secured by the attachment of units of other arms to formations under training.

¹ ARMY HEADQUARTERS, INDIA.

GENERAL STAFF BRANCH.

Dated Simla, 1st September, 1911.

SIR,—I am directed by His Excellency the Commander-in-Chief to transmit to you the attached memorandum on the training of the troops in India.

The object of the memorandum is to review the progress of training during the past year, to indicate the direction in which further progress should be sought, and to assist in the interpretation of the Field Service Regulations and the Training Manuals.

I am, Sir, your obedient Servant,

D. HAIG, *Lieut.-General, Chief of the General Staff.*

General Officers Commanding Armies, Divisions, and Independent
Brigades.

² Training and Manœuvre Regulations Section 38, 38 (2), 38 (3).

This took place more generally during the past season than in previous years.

A special concentration of horse artillery and cavalry, in which the infantry brigade from Ahmednagar also took part, was held at Jalna under the orders of the general officer commanding Southern Army.

Combined naval and military operations were carried out at Aden, Karachi, Bombay, and Rangoon.³ Besides affording a valuable test of the defence schemes, these exercises gave opportunity for the training of the garrisons in accordance with Training and Manœuvre Regulations, Section 4 (8).

The 4th Division was concentrated for divisional training in accordance with Section 39 (2) (b), while inter-divisional manœuvres (Section 39 (2) (c)) were held between the 1st and 2nd Divisions and 1st and 2nd cavalry brigades under the direction of the general officer commanding Northern Army. These were the first inter-divisional manœuvres held since the introduction of the present divisional organization. The result showed clearly the necessity for frequently holding such exercises in order to practice divisional commanders and staffs in the handling of their divisions as a whole, and the troops composing them in the co-operation essential for effective action in war. Many useful lessons were also learnt as regards staff duties and the working of the administrative services in the field.

While in some cases the training shows a certain improvement in various matters referred to in the "Memorandum on Army Training in India, 1909-10"—notably in the practice of the encounter battle, communication, infantry scouting, march discipline of transport, intelligence training, and the study of administrative problems in connection with manœuvres and staff tours—there are other directions in which, in the opinion of the Commander-in-Chief, progress has been disappointing. His Excellency desires, therefore, that all concerned devote their most earnest attention to the following points which have been brought to his notice by inspecting officers.

2.—THE SEVERAL ARMS IN COMBINATION.

(a) *Necessity for every part of the Army to be trained to act in close combination.*⁴

⁵ "The full power of an army can be exerted only when all its parts act in close combination, and this is not possible unless the members of each arm understand the characteristics of the other arms." From

³ In this case it was impossible to arrange the defence rehearsal so as to coincide with the visit of one of His Majesty's ships.

⁴ See also Memorandum on Army Training, 1910, Section 13.

⁵ Field Service Regulations, I, Section 2 (1).

numerous instances brought to notice, His Excellency is of opinion that the training of the several arms in combination is not as satisfactory as it should be. In fact, it is the weak spot of the Army. He therefore desires that general officers commanding divisions and mixed brigades should devote their chief efforts in the coming training season to improving the condition of their commands in this respect.

In this connection it is again necessary to call attention to the value to be gained from training, as far as possible, *in war organizations* under officers who would command them in war and with their proper staffs. The expense of concentrating brigades and divisions is a recognized difficulty in some cases, but every opportunity should be taken to bring together for training as many as possible of the units forming the war organization. At staff tours and other exercises without troops war organizations should invariably be followed, so as to ensure staff units being trained in the duties which would devolve upon them in war. At such exercise, great advantage has resulted from the presence of Army and divisional commanders as directors, thus freeing the divisional and brigade commanders respectively and their staffs for the practice of their proper duties.

⁶ The tendency to over-specialization in training must be continually checked. Much can be done in this direction by the attachment of officers to other arms, and the training of regimental officers in command of mixed forces. Much can also be done by taking advantage of the technical training of special corps, such as sappers and miners, to demonstrate to the other branches of the service their special capabilities and powers.

It has been noticed that in some quarters there is an inclination to over-elaborate general and special ideas for tactical exercises, and to sacrifice instruction to the preservation of an almost academic sequence of events throughout the whole period. In tactical exercises the *object* of *each* exercise should be to exercise the troops in some given situation likely to occur in war. With this aim in view, the scheme should be as simple as possible. The attempt to follow a continuous scheme from day to day (which appears to be particularly common at artillery practice camps), or to carry out field firing as part of the scheme for manœuvres, almost inevitably prevents full use being made of the ground available, and thus cramps the instruction.

Finally, general officers must see that the principles on which the co-operation in war of the several arms should be based, which are distinctly laid down in Field Service Regulations, Part I, are studied and thoroughly understood by all officers. In the succeeding subsections some of the more common errors which have come to notice during the past training season are indicated.

⁶ Training and Manœuvre Regulations, Section 34; Indian Supplement, Section 7 (4).

(b) *Protection*.⁷—Many officers seem to have forgotten the duties of the advanced guard. Such incidents as the deployment of a whole brigade against a detachment of dismounted cavalry supported by a double company, and similar occurrences, ought to be impossible under a sound system of training supervised by a capable divisional commander. Now that the process of gaining close contact is every day becoming more difficult and arduous, the consequences of such mistakes in the handling of an advanced guard are all the more serious.

The conception of an advanced guard (which applies to a detachment, an army, and indeed to a group of armies) dominates all questions connected with the art of leading in war. This is so true that an officer confronted with any given strategic or tactical situation will "avoid making any very gross mistake if he thinks, first of all, of the advanced guard and of the zone of protection which it affords." [General Bonnal.]

In many instances during last training season advanced guards were of insufficient strength and unsuitable composition, and being thus powerless to break down any opposition, caused the premature and unnecessary deployment of the main body. In other cases, advanced guards were withdrawn or fell back immediately on obtaining contact, leaving to the main body the onus of driving in the enemy's advanced troops. Such faulty action on the part of the advanced guard was a fruitful cause of the adoption of wrong lines of advance, with consequent delivery of attacks in the air, which, having no clearly defined objective, in their turn led to undue extension of front, entailing wastage of power and depletion of reserves, or in other words, abdication of command.

The provisions of Field Service Regulations, I, Section 68 (3), were often violated. Protective detachments frequently marched too near to the body which they had been ordered to cover, and forces advanced in close formations while their protective detachments neglected to search all ground within effective artillery range. Such incidents point to gross ignorance or carelessness on the part of commanders, and in war such mistakes might bring disaster upon the Army. His Excellency directs that the general principles of protection laid down in Chapter V of Field Service Regulations, I, shall receive the closest attention.

A tendency has been noticed to withdraw the divisional cavalry from its divisions and employ it on some special duty. It must be borne in mind that the duties of divisional cavalry are "to assist the infantry in the immediate protection of the division by supplying mounted men for patrolling *in connection with* advanced guards, flank guards, rear guards, and outposts; to maintain connection

⁷ See also Memorandum on Army Training, 1910, Section 10.

with the protective cavalry and neighbouring columns; to furnish escorts, orderlies, despatch riders, and facilitate intercommunication generally.”⁸ The same principle applies to the lesser organizations. “Without mounted troops, the other arms are hampered by ignorance of the enemy’s movements”⁹; and “Every detached force of infantry should be accompanied by a proportion of mounted men.” These regulations must not be violated without very good reason.

It is one of the special functions of cavalry to surprise others, and it should never permit itself to be surprised. Yet, during the past season, there has been more than one occasion on which cavalry in bivouac has been completely surprised by infantry or dismounted cavalry owing to neglect to remember that “if an enemy is so continually watched that he can make no movement without being observed, surprise will be impossible.”¹⁰

(c) *Conduct of the fire-fight.*¹¹—Field Service Regulations, I, Section 105, directs that the first object of an attacking force is to gain superiority of fire over the enemy. Yet in numerous attacks observed last winter little attempt appeared to be made to secure a suitable fire position and build up an overwhelming firing line upon it. Again, artillery action is necessary to attain superiority of fire, and the principle of the employment of artillery in the battle is that “the greater the difficulties of the infantry, the closer must be the support of the artillery.”¹² “The object of artillery fire is to assist the infantry advance,”¹³ yet in many actions there was no real co-operation between the two arms. This was in some cases due to the faulty orders of the commander of the force, and in others to want of mutual understanding and intercommunication between the commanders of the attacking infantry and of the artillery.

(d) *Occupation of a position.*—“The defence must have freedom of manœuvre which demands sufficient depth . . . the cavalry, supported by the other arms when necessary, may do much to screen the main position, to mislead the hostile commander as to its exact situation and extent, to induce him to deploy prematurely, and to fatigue his troops in groping for skilfully covered flanks.”¹⁴

Several instances are reported in which the foregoing principles have been overlooked, and, in one case, a considerable force of all arms took up a defensive position, but omitted to detail any troops to screen the position. In the action which ensued, the reserve was

⁸ Field Service Regulations, I, Section 65 (2).

⁹ Field Service Regulations, I, Sections 2 (2), (3).

¹⁰ Field Service Regulations, I, Section 75 (5).

¹¹ See also Memorandum on Army Training, 1910, Section 16.

¹² Field Service Regulations, I, Section 106 (3).

¹³ Field Service Regulations, I, Section 105 (3).

¹⁴ Field Service Regulations, I, Section 108 (4).

moved to repel what was merely a feint, the position became denuded of troops at a vulnerable point, and the defence collapsed. Here again the higher leading was at fault.

(e) *Night operations.*—A more thorough knowledge of how to carry out a night march, and *when* such an operation is advisable seems called for. The objects with which night operations should be undertaken, and the general principles on which they should be conducted, are clearly laid down in Field Service Regulations, I, Chapter IX, yet it was not unfrequent last winter to find night marches made at manœuvres without any compensating results being obtained for the fatigue entailed. Night marches should never be undertaken without full consideration of the object to be attained.

But it is certain that the necessity for such operations will become more and more frequent in the future, and particularly when the opposing forces are in contact, and the Army must therefore be thoroughly trained to them. All arms may be required to work at night, and all must therefore be trained in the duties they may be called upon to perform. For instance, cavalry should be frequently practised in patrol and scouting duties, since it is of the utmost importance to an army that its cavalry should be able to maintain touch, and reconnoitre an enemy during the night. Artillery must be able to occupy positions in darkness. Sappers and miners and pioneers should be exercised, in conjunction with cavalry and infantry, in such work as in war might have to be carried out by them. A large percentage of our British soldiers are townbred, and consequently require much practice to enable them to work well in darkness, and this is the case also, though for different reasons, with the Indian soldier. The first essential for the successful conduct of night operations is, therefore, thorough individual training in night work, for if the rank and file are accustomed to work individually in darkness, collective night operations will present fewer difficulties. For this training the Indian climate offers ample opportunities, but reports show that it has not yet received the attention which it deserves.

3.—CAVALRY.

(a) *Preliminary training.*—Reports show that in too many cases regiments arrived at brigade concentrations or manœuvres insufficiently grounded in the first elements of cavalry evolutions. Consequently, valuable time was wasted in an attempt to correct faults which should have disappeared during the earlier training of individuals and squadrons. In this category are classed the following :—

- (i) Irregularity of pace, due to leaders not being trained to ride the regulation paces over measured distances.
- (ii) Lack of cohesion and opening out during manœuvre, loss of distance and straggling on the march.

- (iii) Inability to pass nullahs, bridges, bad ground, or other obstacles methodically unit by unit.
- (iv) Commanders of squadrons, of regiments, and in some cases of brigades, riding so close to their commands as to be unable to see what is taking place, and so failing to handle their units as the tactical situation demands.

The foregoing faults have been pointed out regularly year after year, but except in the case of a few regiments, insufficient steps have been taken to correct them. Numbers (ii), (iii), and (iv) are largely due to regiments and squadrons being drilled chiefly on smooth parade grounds; this should be the exception. Training for mounted action should normally be carried out in the open country, where rough ground and obstacles are frequently met with, so that units may be accustomed to change their formation at the bidding of their squadron and troop leaders in order to pass the obstacle and reform again without any disorder or straggling. All this is a question of discipline. Only the simplest formations are required for war, but regiments or brigades which cannot perform them without loss of distance or interval in *normal* country, and charge home knee to knee, are sure to be ridden down by cavalry trained on *practical* lines.

Brigadiers and regimental commanders must see that complaints regarding the training of their commands on the above minor points are not again made in the coming season.

(b) *Musketry*.—The Commander-in-Chief is pleased to receive satisfactory reports regarding the good shooting of cavalry regiments generally both British and Indian. Such results reflect the greatest credit on British and Indian officers, non-commissioned officers, and men, as they can only be attained by much hard work and constant practice. At the same time, he is disappointed at the small number of senior cavalry officers who have availed themselves of the opportunity of attending the senior officers musketry courses, where much can be learned regarding the practical application of rifle fire to suit various tactical conditions.

(c) *Cavalry school*.—The cavalry school at Saugor has held its first class, with most satisfactory results. As the thorough system of horse training which is taught at the school becomes generally known throughout the Army, there will no doubt be an even more marked improvement in the training of cavalry horses than has been noticed during the past few years.

(d) *Stable management*.—Stable management is, on the whole, satisfactory. In some cases, however, Indian cavalry regiments have failed to get their horses into condition early enough in the winter.

4.—ARTILLERY.

In last year's training memorandum some improvement in the co-operation of the artillery with the other arms was noticed. Further progress in this respect has been made, and this is no doubt greatly due to the increased interest taken by most divisional commanders in the training of their artillery, and the more general participation of the artillery in the regimental and brigade training of the other arms alluded to in section 1 (b). But, as indicated in section 2 (c), much more remains to be done in order to ensure successful co-operation between the arms in battle.

In the first place, it is essential that the training given at artillery practice camps should be directed exclusively to preparing the artillery for the duties required of that arm in war. As pointed out in a circular letter issued by the War Office, it is undesirable that excessive importance should be attached to developing accurate fire at difficult targets at long ranges. The primary efforts of training should be directed towards making the artillery highly efficient in the support of infantry in the decisive phases of an action. For this purpose, divisional commanders must see that their artillery officers understand the principles of combined action with the infantry, and also of the combination of the different natures of artillery included in the divisional artillery to the best advantage.

Reports indicate that during the past training season there were cases where the mountain artillery showed a disinclination to advance in support of the infantry attack. Special attention must therefore be given to the regulations as to the employment and conduct of this branch of artillery in battle as given in Field Artillery Training, Section 80 (iv). A mountain artillery brigade forms part of the war organization of all divisions, and the use of mountain guns must not therefore be restricted to mountainous country, but full advantage must be taken of their special power of moving with the infantry to "close artillery range whence they can afford the attacking troops effective support in the final stages of the assault."

Similarly, horse artillery should devote particular attention to practice in their special rôle of supporting the cavalry, and cavalry bigadiers should be present at the practice so as to ensure the soundness of the schemes.

¹⁵When deciding upon the ground for practice camps, divisional commanders must take full advantage of the comparative freedom of selection enjoyed in India to avoid constant adherence to open ground, where a very incorrect idea is obtained of the technical difficulties of shooting in "close" country and of the tactical resources which such ground affords. Moreover, *variety* in the actual

¹⁵ Infantry Training, Section 151.

ground worked over, irrespective of its nature, is of itself of value, and the temptation to keep to the same ground year after year must be resisted.

The employment of artillery in battle can only be learnt during exercises executed by troops of all arms, but much can be done to approximate the conditions at artillery practice camps to manœuvres, by the participation of the other arms in the work there. Their presence is absolutely necessary to call into being and to materialize tactical situations true to life. In some cases, however, this participation was impossible owing to infantry brigade training and artillery practice camps being fixed for the same period. The arrangement of the dates for the various trainings, practice camps, &c., is in the hands of divisional commanders, and such over-lapping must be avoided.

Moreover, the personal control of the divisional commander is essential. On the battlefield he gives orders to the artillery, but too often not on the practice ground. He is responsible for everything connected with the preparation of the division for war and with the instruction of officers and men, *in view of the co-operation with the other arms*. It should be his business not only to see that the practice of the artillery is directed on right lines, but also to direct the participation of the cavalry and infantry at the practice camp exercises of the artillery, and to ensure that the tactical situations, which serve as a frame for these exercises, *really conform to the realities of battle*.

In this connection intercommunication requires special practice; for while the general officer commanding indicates to the infantry and artillery commanders the points to be attacked, it is essential that the closest touch should be maintained between these latter during the whole progress of the attack. Otherwise, it will be impossible to ensure that the artillery commander is aware when the infantry requires the help of the guns. But such intercommunication can never be perfect unless the other arms also understand the difficulties of the artillery. With this object general officers should take steps to ensure that they in their turn receive as much benefit as possible from their opportunities of watching artillery practice, and taking part in combined exercises of artillery and the other arms.

But, however much attention is paid to the practical nature of the instruction at practice camps, this can in no wise suffice to ensure the tactical training of artillery officers. At practice camps tactics must frequently be made subservient to shooting, and, although a tactical hypothesis is attached to every series, the tactics are too often in the scheme only, and not in the shooting. This accounts for many errors still only too common in the artillery, and the tactical handling of artillery must be deeply studied apart from the actual hitting of targets. In addition to the direction of training at practice

camps and in tactical exercises, the divisional commander will find schemes on the map an effective means of training, provided that he studies principally the employment of the artillery, that he insists on orders being given in writing, that he takes into account the time necessary for their transmission, and that he makes, *after perusal of these orders*, a serious critique on the operations carried out.

The points, therefore, to which His Excellency requires divisional commanders to devote special attention in the training of their artillery are :

- (i) That the practice of the artillery is primarily directed to such simple methods as are chiefly required for the support of the other arms in battle.
- (ii) That the training of the artillery is throughout carried out in connection with the other arms so as to ensure that co-operation which is essential to success in war.

5.—SAPPERS AND PIONEERS.

The training of sappers and pioneers divides itself into two portions, viz., technical training, and training in co-operation with other arms. The former is primarily the duty of their own commanders, the latter is the concern of the commander and staff of the organization of which they form part.

The technical training is generally satisfactory. Advantage should be taken of every opportunity that offers for obtaining employment on government railways, or under government departments, by both sappers and miners and pioneers, for it is by such employment that organization of labour and the capacity of working under a strain is best learnt by both officers and men.

¹⁶ Co-operation with other arms can only be learnt in tactical exercises and manœuvres. During the past training season a deficiency on this side of their training was noticeable on the part of both the units themselves and of commanders and their staff officers. Thus technical troops have been detailed as escorts to artillery and for outpost duty when other troops were equally available. On the other hand, the special work of such units, such as the opening out of communications, the strengthening of captured localities, and the creation and removal of obstacles, has been neglected. ¹⁷“ Engineer field companies will be employed to the best advantage under the orders of the divisional commander. They may be given separate tasks, such as the construction of obstacles of a technical nature, communications, observation posts, or the improvement of the water-supply, &c., or be distributed to certain localities or sections of the defence. For instance, in the attack, detachments of field companies

¹⁶ Field Service Regulations, I, Section 105 (5).

¹⁷ Manual of Field Engineering, Section 18 (1).

may be employed with local reserves to open a way through obstacles, prepare captured localities for defence, and strengthen the main position, when gained, against counter-attack. In the defence, it may be advisable to allot one or more sections of a field company to each section, to assist with the special technical knowledge and material at their disposal."

Commanders and staff officers should take advantage of the technical knowledge of the senior Royal Engineer officer in the command as regards the most suitable employment of their technical troops. At the same time, it is the duty of the officers commanding technical units to employ their units to the best advantage, in amplification of such orders as they may receive from the staff.

6.—INFANTRY.

(a) *Company training*.—In many cases company training was not systematically carried out, and company commanders were frequently not given a sufficiently free hand. The result was that when battalion training commenced, companies had not attained the necessary standard, and the time allotted to battalion training could not be properly utilized. Brigadiers should be present at company inspections, as these are a test of the battalion commander's ideas regarding the nature of training necessary for war.

¹⁸ The fault of premature extension is still noticeable. Any definite rules on the subject are impossible. Commanders of all grades must study Infantry Training where certain principles are laid down to guide them when deciding on the best formations to adopt under various natures of fire.

¹⁹ As far as infantry is concerned, the principal difference between war and manœuvres is the fact that, in the former, advances are regulated by the enemy's fire, and in the latter by the command of the leaders. This should be thoroughly understood by all ranks. More attention must be paid to two essential factors, viz., reconnaissance before movement, and further practice in the study of ground with regard to fire positions.²⁰

²¹ A reluctance on the part of reinforcements to mix with the units reinforced has been noticed. This reluctance leads to impossible cross movements under fire and requires attention.

(b) *Scouts*.—The standard of training of scouts has improved, but it is still not always conducted on the lines laid down in Infantry Training. It is not unusual, for instance, to see properly constituted protective detachments dispensed with, their places being taken by

¹⁸ Infantry Training, Section 125.

¹⁹ Infantry Training, Section 126.

²⁰ See also Memorandum on Army Training, 1910, Section 18 (ii).

²¹ Infantry Training, Section 129.

parties of scouts. This usurpation of the duties of protective detachments is not part of the rôle of scouts.

(c) *Supply of ammunition.*²²—Up till this year it has been impossible to apply in India the regulations for the supply of ammunition laid down in Infantry Training. It is not surprising therefore that, in spite of many efforts, this subject has not received the amount of attention during training that its paramount importance in war demands. The sections dealing with this subject in the new edition of Infantry Training, 1911, are equally applicable to India, and the principles and methods therein laid down should be thoroughly studied and practised.

²³ At manœuvres the complete ammunition supply service from the divisional ammunition column to the firing line should be practised whenever possible, and umpires should give due importance to the ammunition available on each side in making their decisions. At the same time the practice, which has prevailed in some commands, of ordering men out of position when their ammunition is exhausted, must be discontinued. In the first place, it is opposed in principle to the new umpire rules. More important still, it is bad training for war, in that it inculcates the lesson that men should fall back if their ammunition is exhausted.

7.—VOLUNTEERS.

The Commander-in-Chief is much gratified at the increased interest displayed by general officers on the one hand in the training of the volunteers, and at the keenness displayed by many volunteers themselves, on the other hand, in really trying to understand and practice the special duties which will fall to them in connection with internal defence. Volunteer units and volunteer officers have taken part in the training of regular formations, and regulars have attended volunteer camps to the mutual benefit of both. In some cases, however, the importance of training the volunteers with the troops allotted to internal defence has not been fully realized. It is essential that the definite and important part of the volunteers in internal defence should be fully recognized by the Regular Army.

The instructions contained in Adjutant-General's Circular 29-B of 1909, as regards the training of volunteer corps, are bearing fruit. The percentage of *extra efficient*s is not, however, satisfactory, and His Excellency hopes to see a decided improvement in this respect. In corps where the new training has been adopted, good progress has been made, resulting in a considerable advance in practical efficiency. At the same time, there are still corps where the old methods are pursued, and where training has no higher object than

²² See also Memorandum on Army Training, 1910, Section 18 (iv).

²³ Training and Manœuvre Regulations, Section 57 (8).

mere barrack square efficiency. Even in those corps where the spirit of the new system has been fully grasped, not enough is done to imbue executive officers with the principles. In some cases, too, the proficiency examinations of officers are still conducted in the old way, although the circular referred to expressly prescribes that the new methods shall be followed. Examinations of this sort have no educational value; indeed, they tend to puzzle the candidate and retard progress. The training and inspection of volunteer corps and the examinations of volunteer officers must above all things be practical.

As regards musketry, it has been represented that *repetitions* should be allowed in the standard tests. But this would destroy the object of such tests, which is to ensure the elementary training being thoroughly carried out before proceeding to range practices. In cases, therefore, when the results of the standard tests have been unsatisfactory, general officers commanding should see that more attention is paid to training off the range. Repetition of standard tests is no longer allowed in the Regular Army, either British or Indian, or in the Territorial Force.

Volunteer officers are now asked to undertake the instruction of their units in musketry, while, unfortunately, the accommodation available at the musketry schools in India does not admit of their being allowed to attend as students. General officers commanding should therefore give every assistance to volunteer officers to enable them to qualify for the efficient performance of their musketry duties. To effect this, they should arrange as a temporary measure for short local courses under a qualified officer, instruction being given at such hours as are convenient to those volunteer officers who are able to attend. A skeleton syllabus for these courses will be circulated by the Commandant, Central School of Musketry.

8.—MUSKETRY.

(a) *The annual course.*²⁴—During the last year British units for the first time fired the new Table B, while the volunteers had also the advantage of a new course, and certain selected Indian Army units executed practices similar to those laid down for the British service. This year all troops in India are carrying out the course laid down in Musketry Regulations, Part I, only modified, where necessary, to suit variations in scales of ammunition. In these regulations certain definite principles are now fixed, and must be accepted by all forces in the Empire, but so long as the principles are observed, commanding officers are allowed considerable latitude for variations in detail.

²⁴ Musketry Regulations, I, Sections 417 and 438.

They will also find exercise for their initiative in designing suitable schemes for field practices, so that full benefit may be derived from the ammunition allowed for these.

The keynote of the new course is individuality. The soldier is encouraged to learn the peculiarities of his weapon, and to apply the knowledge so learnt without any extraneous assistance; hence, no coaching is allowed during classification practices. Since, too, individual firing is generally ineffective outside close ranges, no practices beyond 600 yards are included. Within these ranges everything depends on the individual rifleman, and he must be trained to act for himself. At longer distances collective fire must be employed, and field practices should be utilized for this part of musketry training. Prominence is given to rapid fire, as it is now recognized that, on service, targets are often fleeting. To engage them with slow fire will have little effect, while untrained rapid fire merely wastes ammunition, but trained rapid fire may be decisive.

²⁵ Several representations have been made as to the regulations for independent supervision in classification practices. The subject was fully discussed at the General Staff conference at home last January, and the conclusion arrived at was that it was desirable to retain the system. The conditions in India are, however, not quite similar, and the subject will be considered at the General Staff conference next November. Meanwhile, the Musketry Regulations, as modified by the Indian Supplement, must be followed.

(b) *Fire control, direction, and discipline.*²⁶—The most careful system of barrack square and range musketry is a failure if its lessons are thrown to the winds as soon as troops are engaged under conditions approaching those of war. Men will do in war what they are trained to do in peace. Reports indicate that at large concentrations, such as divisional manœuvres, much less attention is paid to the application of musketry principles than is the case at brigade and regimental training, and that such essential features of the fire fight as covering fire and mutual support are neglected. The inference is that the higher musketry training of the Army is superficial, and that there is a serious relaxation of fire discipline as soon as manœuvres in higher organizations take place. The principles are very clearly indicated in the Musketry Regulations,²⁷ and they must be so thoroughly understood by officers and men as to become a second nature to them, and be acted upon as it were by *instinct*.

²⁸ Fire control and direction suffer also from lack of clear fire orders and vagueness in the description of objectives. "At the enemy in front at 1,000 yards" leaves room for much difference of opinion.

²⁵ Musketry Regulations, I, Section 477.

²⁶ See also Memorandum on Army Training, 1910, Section 18 (1).

²⁷ Musketry Regulations, I, Sections 1-4, 503-511.

²⁸ Musketry Regulations, I, Section 279.

The difficulty of the subject is apparent, but a more general use of the "clock face" or other methods is called for.

There is a very general tendency to neglect elementary training, without which a high standard of individual shooting cannot be expected. The importance of rapidity in loading, in adjustment of sights, and in opening fire has in no way diminished. The chief points brought to notice, which require further attention, are neglect of the *tests* in elementary training, judging distance, and range taking; failure to carry out the revolver course; and to follow the principles of the regulations with regard to the colours used on figure targets. The neglect of these matters is an indication that the Musketry Regulations have not received the attention they deserve. Unless these regulations are grasped by all ranks responsible for instruction, the efficiency of the army will suffer.

The practical result of want of sound training is well shown by the following extract from the report on one of the few occasions on which our troops were in action during the past year:—"Much of the enemy's firing was with Martini-Henry rifles and black powder, and the puffs of smoke were distinctly seen by all. The men at once opened fire on these puffs, each with his own idea of the range and elevation. Not in a single case did I see an officer or fire leader give the elevation or direct his units to fire collectively. As the firing was individual at medium and long ranges, and quite impossible to observe, I do not suppose our shots were anywhere near the enemy."

(c) *Field practices*.—It must be realized that range shooting is only a step in the musketry training of the soldier. The soldier's training is not perfected till he has been thoroughly exercised in individual, sectional, and company field exercises. Returns of ammunition show that little over 50 per cent. of the ammunition available for field practices has been so expended. It is recognized that there are in some cases local difficulties, but at the same time the Commander-in-Chief considers that further efforts should be made to carry out thoroughly Parts IV to VI of Table B. The fire problems which form a feature of training in the Sirhind, and some other brigades, are commended to the notice of all commanders.

²⁹ Chapter VII, Musketry Regulations, gives the general principles on which field practices should be conducted, but does not go beyond company practices. In India, owing to local facilities, it is possible to aim at something higher. Realistic collective exercises by forces of all arms can often be arranged, and the greatest importance is attached to field firing of this nature. But it must be carried out on sound lines. No advantage can result when, as has sometimes occurred, such exercises take the form of semi-ceremonial advances of over-extended battalions in which the attack has lacked depth,

²⁹ Training and Manœuvre Regulations, Indian Supplement, Section 7 (5).

no real attempt has been made to build up a firing line, and special covering fire has not been arranged for; or when artillery fire has been confined to the discredited "artillery preparation," of which the infantry have remained idle spectators, thus destroying the principle of co-operation between the two arms.

(d) *Narrative reports.*—The narrative reports rendered by general officers commanding divisions are not always satisfactory. Repetition of extracts from the annual returns of units is unnecessary, unless quoted with some special object, since the originals of the annual returns are themselves available. The narrative reports should be brief and contain only such general remarks on musketry training as divisional commanders may wish to make, together with notes on any special points they desire to bring to notice.

9.—MACHINE GUNS.

During the past year considerable attention has been paid to the work of machine guns, but it cannot be said that their training is yet satisfactory, especially in view of the neglect in too many cases to carry out the course of *practice* laid down. Failure in tactical handling is no doubt to some extent due to the want of guidance in the past, and with the issue of new editions of Cavalry and Infantry Training, containing full instructions as to the drill of machine gun sections and the employment of machine guns in battle, great improvement may be expected. The recently instituted changes in the machine gun courses at the schools of musketry will also, it is hoped, have a beneficial effect.

In view of the necessity in certain circumstances of brigading machine guns in battle, brigade commanders must arrange to assemble the machine guns sections for such training, and to practice both methods of employment during brigade training. But the practice of employing an artillery officer as brigade machine gun officer is unsound, as it is opposed to the principle that the officer who is to command in war should train in peace. An artillery officer may, with advantage, be employed to *assist* in such training, but when this is done, care must be taken to avoid the adoption of artillery terms—such as "battery," &c.—which are unsuitable to the methods of employment of machine guns, and unwarranted by the regulations.

10.—COMMUNICATIONS.

The Commander-in-Chief is glad to note a marked rise in the standard of visual signalling. In most units the signallers have sufficient mechanical proficiency to work well at the most effective rates of speed. But the rapidity of the work must be gauged by the whole time taken to transmit a message from the original writer to

the addressee. To reduce this time, organization, accuracy, uniformity, and rigid adherence to station discipline require most attention. The opening of communication by visual signalling is occasionally delayed by failure to keep up a good look-out all round. More practice is required in Indian units in the rapid alignment of heliographs and the picking up of stations. Map reading has not yet reached the standard to which signallers may be expected to attain. Pending the inclusion of telephone work in the test for regimental signallers, all signallers of units equipped with telephones will be trained and inspected in their use.

But the highest technical excellence in the signalling service is of little avail if the *habit of intercommunication* is not developed. It is only by rigid adherence to the principles laid down in Field Service Regulations, Part I, Section 8, that effective co-operation can be assured in the field. Subordinate commanders too frequently neglect to keep their superiors informed of what is going on around them, with the result that the higher commanders are left enveloped in the fog of war. The latter, on the other hand, are too prone to wait for reports instead of taking steps to rectify such grave omissions. An instance occurred at the inter-divisional manœuvres where a divisional commander remained ignorant of the whereabouts of his whole cavalry brigade for 24 hours, although it was only 10 miles distant. The formation of the signal companies does not remove from the commanders of units the responsibility laid upon them by paras. (1) and (2) of the above Section. More can be done to assist orderlies and despatch riders in the delivery of messages. Their work is often extremely difficult, and if effective arrangements are not made by those who may expect messages, there may be delays of hours. For instance, the establishment of a headquarters where messages can be received during the absence of a divisional or brigade commander is strictly enjoined, but instances have been frequent of the neglect of this precaution.

As regards the responsibilities of the newly created signal companies, the officer commanding a signal unit, or a section of it, is attached to the headquarters of the formation to which his unit or section belongs. He must receive the earliest possible information of every move decided on, and should then be held responsible that his dispositions ensure communication being open when the tactical situation most demands it. It should be remembered that when forces are on the move, *continuous* signal communication entails an expenditure of *personnel* and equipment that is usually inadvisable, if not impracticable, and the intermittent opportunities of communication must, therefore, be foreseen and fully utilized. The co-ordination of all available methods of communication, *i.e.*, telephones, visual signalling, despatch riders, &c., must be especially practised. Too much reliance on one method (for instance, the heliograph by

day, or the telephone by night) will result in a breakdown, when these methods fail, as sooner or later they will.

11.—ADMINISTRATIVE SERVICES.

A considerable advance has been made in the training of the administrative services for war, owing to the greater attention paid to the subject, both at manœuvres and staff tours, and the increased attendance of departmental officers at the latter. Useful problems as to the work of the administrative services and departments have been worked out during these exercises, and, in some cases, the schemes of a staff have, on return to cantonments, been studied in greater detail from a departmental point of view, for the benefit of those who could not be present at the staff tour itself. But it is not yet fully realized in all quarters that the instructions as to the individual training of officers by staff tours, regimental exercises, war games, essays, indoor schemes, and lectures given in Chapter II, Training and Manœuvre Regulations, apply to officers of such services. Every assistance in carrying out this training should be afforded to the heads of departments by officers of the General Staff. Moreover, the presence of such officers at departmental exercises will ensure the co-ordination of this departmental training with that of the division as a whole.

(a) *Supply and transport.*—The Supply and Transport School at Rawalpindi has now been established on a permanent basis and is doing excellent work, which should greatly raise the standard of professional knowledge in the officers of that corps. Endeavours have also been continued to make the work of the Supply and Transport Corps on manœuvres conform more nearly to what will be required of it in war, and at the inter-divisional manœuvres, the system followed for the supply of fuel and fodder was to collect such supplies at certain depôts, which were held to represent villages in the theatre of war, with the intention that, after selection of their bivouacs in accordance with tactical considerations, units should send out and collect forage from these villages as they would do on service. In some few cases this intention was understood and followed, but, on the whole, the result was disappointing, owing to the want of enterprise shown by commanders in utilizing the means available for the replenishment of supplies.

³⁰Another point to which attention must be paid is the responsibility of general, staff, and regimental officers for ensuring that every assistance is given to the departments. For instance, provision is made in regulations for the training of officers in various duties connected with supply and transport, and full advantage should be taken of these, while the services of those so trained should be utilized

³⁰ Army Regulations, India, Vol. II, Sections 670, 949, 950, and 951.

to the full. The work of the department is increased, and the completion of the issue of supplies is often in consequence retarded, by a want of forethought in small matters, such as the preparation of indents. Demands from units should, when possible, be placed on one indent, and all details attached to the unit should be included. The requirements of individual officers should similarly be included in the combined indent of the staff, or other unit, to which they are attached.

Practice in packing and loading does not always receive the attention it deserves. The Army in India is, to a great extent, dependent upon pack transport, and to work efficiently such transport requires the most constant attention. Bad loading inevitably leads to sore backs and it was noticeable how units varied in this respect, and how, as manœuvres progressed, they improved. This points to want of training of officers and men in practical packing and loading, and indicates the necessity for attention to this subject in order to avoid a large number of preventible casualties in transport animals at the commencement of a campaign, *and consequent loss of mobility in the fighting troops*. In addition to the considerable number of officers and non-commissioned officers trained in the Supply and Transport School at Rawalpindi, many others have been trained in divisional classes, while in many stations officers and *personnel* of transport units are available as instructors. With so many instructors available, inefficiency in this branch of training is inexcusable.

It was also noticed at manœuvres that in a number of instances regimental transport officers appeared to be unaware of their responsibilities and duties, as laid down in Field Service Regulations. In cases where it is not possible to return transport detachments to their corps after a day's march, regimental transport officers must give close attention to watering and feeding, to examination of backs and saddles, and all other necessary details of stable management.

(b) *Medical*.—In last year's training memorandum, attention was drawn to the necessity of training the medical services in peace for their duties in war. But His Excellency is not satisfied with the attendance of medical officers of senior rank at staff tours and manœuvres. In some cases quite junior officers were permitted to act in the higher medical posts during important manœuvres, and thus the opportunity for training administrative medical officers in field work was lost. The appointments which principal medical officers should hold on such occasions is a matter for the general officer commanding to decide, and in this he will be guided by the principles contained in Training and Manœuvre Regulations and its Indian Supplement.³¹

³¹ The provisions of General Staff Letter No. 2886-1, dated 30th June, 1911, having been embodied in this paragraph, that Letter is cancelled.

Some progress has been made with the employment of a skeleton medical organization at manœuvres, sections of British and Indian field ambulances having been mobilized for brigade and divisional training, as well as modified regimental sanitary services, clearing hospitals, &c. At the inter-divisional manœuvres, considerable inconvenience was caused to officers commanding field ambulances by the failure to keep them informed of the position of the clearing hospital. This points to the necessity for closer touch between the staff and administrative services, which can only be ensured by practice together at staff tours and manœuvres.

Attention should be devoted to the graduated training of the medical services during the year, to enable officers and subordinates to take full advantage of the opportunities given them at manœuvres of extending their knowledge of the duties of the medical service in the field.

There is, unfortunately, little opportunity of training army hospital corps and army bearer corps companies in their field duties. The former should, however, have systematic training, conducted from each station hospital, in field cooking, camp sanitation, and camp duties. The latter should undergo graduated route marches according to length of service and training, until they can carry a weight of at least 2 maunds, in a dhoolie, a distance of 15 miles without distress.

(c) *Veterinary*.—The rules contained in Army Regulations, India, Volume VIII, with regard to the selection of soldiers to attend the Army Veterinary Schools are sometimes overlooked. During the past year it has been found necessary to send several Indian candidates back to their units as they were unable to read or write. Men selected for these classes should, if possible, have some elementary practical knowledge of sick-line work, and should at least be accustomed to handling animals.

It is also desirable that men who have passed a course at an Army Veterinary School should be afterwards employed periodically amongst sick animals, as, otherwise, they forget what they have learnt.

12.—STAFF DUTIES.

(a) *Training of staffs*.—However thoroughly the distribution of duties between the various branches of the staff is understood, it cannot be expected that the work in the field will be carried out successfully unless the staff has been thoroughly *trained as a whole in the field*. In order to ensure smooth working, it is as necessary for staffs as for troops to have systematic and constant practical training as units in the duties which will devolve upon them in war. The want of co-operation between different bodies of troops engaged in the same operation is frequently due to this want of training on the part of the staffs of divisions and brigades; and this failure is

inevitable if the training of the staff in their work in the field is confined to the periods of brigade and divisional training. Opportunities for actual practice with large units, such as a division, must of necessity be very limited. But much can be done by previous training at staff tours and in staff exercises on the lines laid down for regimental exercises in the Training and Manœuvre Regulations. These latter can be held in the vicinity of cantonments, and require only a few hours for execution. It is the duty of senior staff officers to supervise such exercises, and they must be continually thinking how it is possible to develop the training of their subordinates for war.

³² The following are points to which special attention should be drawn in such staff trainings :—

The neglect to use staff officers for personal reconnaissance, and the unnecessarily large number of staff officers and gallopers who accompany some general officers. On the march, or in action, a general officer commanding a division should be accompanied by as few officers as possible. The remainder of the staff should have definite places allotted to them by the senior general staff officer for carrying on their work.

The length of the orders issued. Conciseness in orders is of the utmost importance. To insure that an order may be properly carried out, the first thing necessary is that it should be intelligently conceived and *despatched in time*. This is especially necessary in operation orders for the following day, for if the orders are long, they only reach the troops late at night when everybody is tired out. Then it may happen, for we are all human, that the salient points of such detailed orders are not at once properly noticed and appreciated.

(b) *Intelligence courses*. The special divisional courses for instruction in intelligence duties, which were held for the first time, have on the whole been satisfactorily carried out. General officers commanding report favourably of the advantages that those who went through them have derived from the instruction, and credit is due to the instructors, who have evidently taken great trouble in planning out the scheme of work and making the course both interesting and useful. Several officers who had gone through these courses were employed with success at the inter-divisional manœuvres, and thus obtained a useful opportunity of practically applying the lessons which they had recently studied; but when this course is followed, attention must be paid to the provisions of Section 63, Training and Manœuvre Regulations.

In the programme of work carried out, some divisions went rather outside the syllabus and spent time on matters which do not come within the province of an intelligence officer. A revised syllabus and

³² Field Service Regulations, I, Section 92 (2).

instructions for carrying out such courses have since been issued and are to be adhered to. It is difficult to deal thoroughly with the subjects laid down in the 24 working days allowed for the course, and no attempt should be made to give instruction in duties which are not included in the syllabus.

(c) *Umpiring*.³³—Since the conclusion of last season's training revised umpire rules have been issued, which it is hoped will get over some of the difficulties experienced last year. But it was very evident that such failures as occurred in the umpiring were chiefly due to ignorance of their duties on the part of both umpires and of regimental officers. Since the regulations are based on the principle that "the responsibility for conducting operations as nearly as possible in accordance with service conditions rests with the commanders, their staffs, and the regimental officers with the troops, it is essential that *all officers*, and not only those of the umpire staff, should be thoroughly conversant with the principles of the regulations. This is a matter to which divisional commanders should devote their particular attention before next season. It is one in which lectures by the general staff officers of divisions, or other well qualified officers, should be of great assistance.³⁴

13.—CONCLUSIONS.

³⁵ "Success in war depends more on moral than on physical qualities." The development of the necessary moral qualities—courage, energy, determination, endurance, perseverance, and unselfishness—must therefore claim the first attention of all commanding officers. Without these qualities, which mean *discipline*, no combination will be possible.

These are indispensable factors, and an army imbued with these qualities always has won—and always will win—*provided it is directed with determination and intelligence*. To ensure that our leaders are able to direct their commands efficiently in war, it is essential that they should have a clear conception of what modern war is, and how battles are won. We must, however, be on our guard against taking the most recent experience of war as the *only* guide to follow. "It is quite true that the introduction of improved arms has produced very considerable modifications in the method of fighting; but these modifications are not so much changes as the growth and development of principles that have been known for hundreds of years." These principles which have stood the test of time are embodied in the Field Service Regulations. They are "neither very numerous,

³³ Amendments to Training and Manœuvre Regulations, issued with Special Army Order, dated 22nd March, 1911.

³⁴ See also Appendix, Section 17.

³⁵ Field Service Regulations, I, Section I (2).

nor in themselves very abstruse." Put briefly, in addition to the indispensable moral factors alluded to above, success most frequently depends in the development of *mobility, combination, and fire-power*, and the difficulty consists in the *application* of principles. Herein lies one of the *chief duties of divisional generals*. Aided by their staff officers, they must interpret the regulations in the right spirit. Without a sound doctrine, the regulations will be of little use to the Army in fitting it for war, and our system of peace training will be on false lines. In this respect, the following points demand the most careful attention of all divisional commanders :—

There must be thorough agreement amongst all officers upon questions of tactical principles. Peace training must aim at developing mutual understanding and agreement amongst leaders of all ranks.

³⁶ Foresight and initiative must be encouraged. Only the general situation and the task required should be prescribed. All details as to the method of execution must be left to the subordinate leaders, whose further advancement will depend on the results attained by them. In an army, where every detail is prescribed to subordinate leaders, there can be no independent action on their part, but they will wait for orders, a state of things fatal to success in war. It should be recognized that in some circumstances the subordinate leader will obey his orders, not by following them to the letter, but by weighing the premises on which they are based, and then acting in harmony with the general design of his commander.

There can be no question as to the importance to the Army of training on these lines. Successful combination largely depends on the intelligence of subordinate leaders in grasping the commander's plans; unless they are taught how to do this in peace, they will fail in war. Moltke himself says of the battles before Metz: "The self-dependence of the subordinate commanders, *so thoroughly inculcated by the peace manœuvres*, in conjunction with the *well-grounded training of the individual*, here asserted themselves with all their advantages." This must be the main objective of our peace training: well grounded training of the individual; self-dependence of subordinate commanders.

The more thoroughly the true spirit of the regulations permeates the whole Army, the higher will be the degree of combination attainable. His Excellency looks with confidence to divisional commanders not only to impart to their subordinates the necessary energy and driving power which is essential to success in war, but also to infuse into them sound ideas as to how the basic principles of war must be *applied* in order to attain success.

Lastly, the Commander-in-Chief desires that his thanks may be expressed to those officers of the Civil Service who so kindly assisted

³⁶ Field Service Regulations, I, Section 12

in the training of the Army last season by giving lectures on the civil administration of the country. His Excellency is anxious that the most friendly and sympathetic relations should exist between military officers and officers of the Civil Service, in internal India itself as well as on the frontier. The ultimate object of both services is practically the same, viz., the maintenance of law and order for the development of the country. To this end close and mutual co-operation is necessary between the two services. Regimental officers of Indian units should also be encouraged to take an interest in current questions of social reform which closely concern the welfare of their men. Many of these are highly commendable, as they have for their object the improvement of the social and educational conditions of the country. At the same time, some are susceptible of being twisted from their proper aims and of being used as a means of stirring up a spirit of anti-British disaffection. Provided, however, that a spirit of cordial and intelligent co-operation animates the two services, there is little likelihood of this occurring to any dangerous extent.

14.—TRAINING PROGRAMME FOR 1911-12.

Owing to the expense of the concentration of troops in connection with the visit of the King-Emperor, it is possible that the amount available for ordinary training during the season 1911-12 may be reduced. In this event, general officers commanding must be guided by the principles laid down in Training and Manœuvre Regulations, Section 36 (1).

³⁷ The Commander-in-Chief has, however, much pleasure in announcing that the Government of India have sanctioned the increase of the training grant in future from 3 to 4 lakhs, a sum which it is hoped will be sufficient to allow of divisional training annually in most divisions. Great improvement in the work of divisions as a whole—the weak spot in the efficiency of the Army in India for war—should result. His Excellency is of opinion that if proper care is devoted to the organization of the training, the necessary progress can be made without in any way overworking the troops. As pointed out last year:—"There is room for the exercise of more discretion as to the amount of work that can reasonably be expected from troops during the winter. . . . Modern training it is true demands hard work, but this hard work needs regulation."

³⁷ Memorandum on Army Training in India, July 1910, Section 15.

VIII.

COMPANY TRAINING.

By BRIGADIER-GENERAL R. HAKING, C.B., Commanding 5th Infantry Brigade.

THE ART OF IMPARTING INSTRUCTION.

THERE is little doubt that tactical schemes are out of place during Company Training, which has frequently been spoilt by Company Commanders devoting several days to the solution of tactical problems instead of allotting the whole period to the training of their men in the use of their weapons and of the ground.

It is, to a great extent, immaterial to the private soldier, and, to a lesser degree, to the non-commissioned officer, whether he is taking part in the action of an advanced guard, the attack, the defence, outposts, or any other military operation in the face of the enemy, so far as the solution of the tactical problem is concerned. On all these occasions the individual man, the groups, or the sections that we are endeavouring to instruct, are doing one of three things :

- (a) Attacking.
- (b) Defending.
- (c) Engaged upon some service of security, such as scouting, sentry work, or patrolling.

It is not suggested that the non-commissioned officers and men should not be trained in the main principles of tactics, so that they can take an intelligent part in every operation of war, but these principles should be taught by a study of the weapons they have to use, and the ground they have to pass over or occupy, and not by a study of how to solve any particular tactical problem.

In any programme for Company Training, the only tactical scheme required is a brief statement showing what class of operation it is proposed to teach during the day. For example, the Company Commander may intend to practise his company over different types of ground in the early stages of an attack, in the defence, or the service of security. Whatever the subject may be, no general and special idea is required, and all that is necessary is to give the men a clear and interesting lecture, either on the afternoon of the previous day, or on

the morning before going out, dealing with the subject of instruction for the day.

It appears, therefore, that two forms of instruction are required : one to be given by means of lectures to the non-commissioned officers and men before going out, and the other by means of demonstrations and practice on the ground.

INSTRUCTION INDOORS.

The preparation and delivery of lectures to the men indoors appear to present great difficulties to many officers, who seem content to think that the art of instructing others is an inborn gift which some people possess and which others do not. That it is like painting pictures, or writing poetry, and that a person must possess a great deal of imagination if good results are to be expected. Some officers complain of the difficulty of putting their ideas into words and expressing themselves fluently, and for that reason think that they can never be good instructors. Others have a feeling bordering on contempt for any form of instruction, and possess a sort of vague idea that when war comes, they and their men will give a good account of themselves because they are quite sure they can lead them forward against the enemy. The latter class of officer usually possesses many valuable military characteristics, and if only he can be taught the necessity for studying war, and for teaching those under him how they ought to act in war, his value will be greatly increased.

There is no doubt that some people are naturally better than others in the art of imparting instruction, and if we take the example of a large public school, we shall find that some of the masters are much more successful than others, because they manage to make their students take an interest in their work, whereas, without this interest, progress is always slow. But—and here is the crux of the whole matter—all the masters impart knowledge, because they thoroughly understand their subject. They are aware that they know a great deal more about their subject than the people they are teaching, and this knowledge adds to their power of instruction, because it gives them self-confidence.

Take the most unimaginative company officer that you know, talk to him about hunting, polo, golf, or any other work or amusement in which he excels, and he will give you some very valuable instruction, because he thoroughly understands his subject. If he discovers during the conversation that he knows a great deal more about the subject than you do, his power of imparting knowledge will increase, because his self-confidence will increase.

Suppose, as another example, that you suddenly become absolutely destitute, and are thrown on the world with no means of obtaining work or food. Ask the first beggar you meet on the road how he lives ; he

can give you, if he wishes, some very valuable instruction in the art, because he thoroughly understands the subject.

The first step, therefore, towards gaining proficiency in the art of instructing others, is to attain a thorough knowledge of the subject we are anxious to teach. This will greatly assist us in the next step, which is to gain sufficient self-confidence to put our knowledge into words.

The third stage on our journey is to arrange our ideas in a logical manner, so that the ordinary recruit, who possesses much more intelligence than we usually place to his credit, will understand, without difficulty, when we translate our ideas into words.

The simplest and most effective method of putting our ideas into words is to take a pencil and some paper and write down a series of questions, adding what we believe to be the correct answer to each. Suppose we want to explain to our non-commissioned officers and men the main principles of the attack, we can work out our lecture beforehand on the following lines :—

First of all, what are we trying to do when we attack the enemy ?—We are endeavouring to drive him from the ground he is holding, to kill and wound as many of his men as possible. Our main object being to break down his power of future opposition with the least possible loss to ourselves ; partly because we do not want to be killed and wounded, and partly because we wish to retain the means of again attacking him.

How are we to set about doing this ?—We cannot walk straight up to the enemy's position, fix bayonets, and charge, because if we do the enemy will kill us long before we get close enough to charge. It is evident, therefore, that we must consider not only the ultimate charge, but the various preliminary steps that must be taken, in order to place ourselves eventually in a position, as regards mind, body, and ground, where a charge is not only possible, but likely to succeed.

What, then, is the first stage ?—We march with the battalion in close formation along a road or track towards the enemy.

What is the next stage ?—When we get within range of the enemy's artillery, and are within view of his batteries or his observing posts, we must deploy.

Why must we deploy ?—If we do not, the enemy's guns would have a splendid target, and would mow us down by dozens at a time when we are too far away to use our own rifles.

Does the whole company deploy in one body, or only part of it ?—Only part of it.

Why ?—Because, during the early stages of the attack, it is probable that the company is not within range of the enemy's rifle fire, and cannot therefore use their own rifles against him, but it is likely to be exposed to hostile artillery fire. If the whole company deploys, it will advance in a thick line and be a good target for hostile guns.

If we are not to deploy the whole company, what is the best formation to adopt?—That will depend upon whether the ground is perfectly open, or whether it affords a certain amount of cover from the enemy's fire and view; it will also depend upon the intensity of the enemy's artillery fire. If the ground is open, we must adopt some formation which is difficult for the enemy's guns to range upon, and therefore difficult for him to hit us. A whole lecture could be given on this subject. How do the artillery range? What is a difficult target for them? Of the several possible formations to adopt which is the best, and why? &c.

Having deployed the company what is the next thing to do?—To cover the ground as rapidly as possible until the company can get close enough to the enemy's position to use their rifles with effect.

Why must we advance rapidly?—Because, if we advance slowly, we are giving the enemy's guns a longer time to fire at us, and, consequently, we shall lose more men than if we advance rapidly.

How are we to advance rapidly?—To advance rapidly we must move at the double, but we cannot cover long distances at the double without wearing out the men before we have done any good. We must have halts.

Where are we to halt?—We must select halting places where cover from the enemy's fire is obtained.

Suppose there is no cover to be found, what then?—We must select halting places where the enemy's artillery fire is not very effective.

How are we to locate such places?—By studying the action of artillery against advancing infantry. It is not easy for artillery, when firing at advancing infantry who are in good formations, to follow them with bursting shells with sufficient accuracy to cause heavy loss. The artillery range beforehand on certain localities, and when they see our company or any other target appearing on that locality, they endeavour to stop it by rapid fire. Having stopped it they have now a stationary target, which they like best, and they can destroy it at their leisure.

This information is not much good to us unless we know what type of locality artillery usually range upon. Their favourite locality is the brow of a hill or ridge, the edge of a wood, a hedgerow, an enclosure like farm buildings, the line of an obstacle, such as a stream. It is clear, therefore, that our company must advance as rapidly as possible over such localities.

Is it easy to do this?—No, because the natural tendency of a human being is to halt and lie down immediately he comes under a heavy shell fire. This is the most dangerous thing he can do, and is just what the enemy's artillery want him to do.

How can we practice this in peace time?—We cannot practice it properly because the shells do not burst over our heads, but it can be

seen at an artillery practice camp when the guns are firing at a succession of targets put up to represent advancing infantry. At practice camps, however, these targets are always halted, and thus offer a good mark to the guns. Our infantry should not halt in these exposed localities.

Suppose part only of the ground is exposed to artillery fire, how do we advance then?—We move as rapidly as possible over the exposed portions, and walk and rest whilst traversing the unexposed positions.

What are our artillery doing all this time?—They are endeavouring to keep down the fire of the enemy's artillery, or to draw it on to themselves away from our company.

Suppose the enemy's artillery are in concealed positions, what do our artillery do?—It is then very difficult for our artillery to help us, unless they can locate the enemy's guns by their flashes or by any other means, such as a balloon, or closer reconnaissance by aeroplane, &c. The enemy's guns must be at least 15 feet below the level of the crest of a hill to hide their flashes, and it is not always possible to find such positions, and even when found, their fire is not so easy to direct as when the guns are close behind the crest, and then their flashes are visible.

The above is sufficient to explain the system, and to show that a series of questions and answers, on any particular operation, can be prepared without serious difficulty by any company commander who thoroughly understands what he is trying to teach his men.

By this system, difficulties which will occur in war are recognized and faced, and, consequently, there is no vagueness about the instruction. A definite question is put, and a definite answer provided. Even if an officer cannot prepare many such questions, and provide the answers, what he does do will at least be sound instruction.

Another advantage is that if an officer be doubtful about his powers of delivering a lecture, he can prepare these questions and answers and give them to the men in a conversational form, which is certain to attract their attention and interest, especially if illustrated by rough sketches on the black board. The system can be applied to any form of tactical training, with always the same type of question.

What do we want to do? How are we going to set about doing it? What is the first thing to do? What is the next? And so on. Then come the difficulties. Suppose so and so, and so and so—what then? Why do we do this rather than anything else?

It is probable that the most unimaginative officer in the Army can carry out some very capable instruction on these lines—provided he possesses the necessary knowledge. That must be obtained before any instruction can be given—a truism which is not always realized.

It is necessary, however, to strike one note of warning. If a question suggests itself to us, and we cannot supply the answer ourselves, do not let us cross out the question. Ask somebody else, but do not

shirk the answer. If the question occurs to us it will occur to our audience, and we must have an answer to it.

When it is necessary to give vague answers, such as "that depends upon the circumstances of the case," or "that depends upon the ground," we should always give one or more solutions in certain definite circumstances or on certain definite types of ground. It is perfectly useless to expect men to apply general principles of tactics to definite circumstances or to ground. We must teach them how to apply the principles, and the more examples we give, especially as regards the ground, the better will be our instruction.

As regards the delivery of instruction to the men, papers should never be read out. When a person reads a lecture everyone begins to think of something else, and soon no one is paying attention. Directly the lecturer begins to talk in an ordinary conversational manner, every one looks up and begins to listen.

INSTRUCTION ON THE GROUND.

The keynote of good instruction out-of-doors is to get the non-commissioned officers and men as far as possible to instruct themselves. For example, you wish to teach the men how a sentry post for a group of men is selected. You have already made out questions and answers on the subject, and have given them a lecture indoors. They know, therefore, a good deal about the requirements of the case. Take three men and tell them you want them to select what they think is the best position for the sentry. Show them the place where the piquet is to be posted, and let them go out entirely by themselves and choose their own position. Then do the same with three more men, and so on. Meanwhile, the rest of the company can look on, and criticise what is being done. They will find that quite easy to do, and it will rouse their interest, and teach them a good deal. Finally, compare the position selected by one group with that selected by another group, explain the advantages and disadvantages of each, and state what would have been the best locality to choose.

If the men appear very backward, transfer the scene from military to civil life; tell them, if they are recruits, that the piquet represents some boys stealing Farmer Jones' apples, and that they have been told to give warning of Farmer Jones' approach. Or, tell them that the piquet is a party of men snaring rabbits, and they have been told to look out for and give warning of the approach of the keepers. That may be a somewhat unseemly method of imparting instruction, but it is very effective, and propriety and war are not very close allies.

Suppose it is desired to instruct the men in the proper method of advancing from one fire position to another over different types of ground. They will have already received a lecture on the subject, and they can be reminded of the main facts in a few words.

Take one section, and place them in a fire position some 900 yards from the enemy, tell them they have got to get forward to another fire position, so as to get nearer to the enemy and break down his defence. Recapitulate the things the men should pay attention to.

- (1) They must move as rapidly as possible, so as to be exposed to fire as short a time as possible.
- (2) They must halt for breath in a locality covered from the enemy's fire if they can find one.
- (3) Having reached this locality, and whilst they are regaining their breath, they must recharge their magazines and adjust their sights to the new range.
- (4) Directly they have got their breath, they must rush forward and occupy a position from which they can see and fire at the enemy if such a position exists.

Let each section do this one after the other over the same bit of ground, the others meanwhile looking on and criticising. When each section has finished, take the whole company over the ground, halt where each section halted, and occupy the fire position occupied by each section. Explain why one halting place or fire position is better than another, and the mistakes made by each section. Say what it would have been best to do, and then do exactly the same thing over a different bit of ground. Different ground can usually be found by facing the company to the right, left, or rear.

Similarly, when teaching the company how to occupy a position for defence, let each section choose the line for the trenches in turn. Recapitulate the main points of the lecture which will have been given previously on the subject, tell them they are to choose a place where they can see to shoot as far as their rifles can fire with effect, that the line must not be more exposed than can be helped, and that there should be no dead ground in front if it can be avoided. It will be most instructive to see how each section will arrive at a compromise between these conflicting requirements.

Whilst each section is at work, the remainder of the company should look on, the non-commissioned officers encouraging the men to suggest improvements or to point out mistakes. This can only be done by asking individual men definite questions.

When preparing a programme for company training, the company commander should divide the tactical training into three parts:—Attack, defence, and service of security. The attack should again be divided into three parts, namely:—

- (1) The approach to the enemy's position when exposed to artillery fire, and when the company is too far off to use their rifles.
- (2) The advance under artillery and infantry fire, from the range when the men can use their rifles up to the locality when the fight commences for superiority of fire. The passage of

obstacles, such as small streams, hedges, small woods, enclosures, &c., being also practised.

- (3) The struggle for superiority of fire, the close approach to the enemy's position, and the assault.

The defence should be practised on many different types of slope, several positions can be occupied during the morning's work, the reasons for the selection of the particular line of trenches in each case being invariably explained to the men.

IX.

MILITARY AVIATION.¹

By CAPTAIN H. R. M. BROOKE-POPHAM, Oxfordshire Light Infantry.

ALTHOUGH this lecture will be confined to the subject of aeroplanes, I do not wish to give the impression that the study of dirigibles should be neglected, as they will have their rôle in war. France is still spending large sums on building them.

EFFECT OF RAIN AND WIND.

Rain is very unpleasant to fly in, but otherwise does not affect an aeroplane. It will make it slightly heavier but not much, as the wet will be blown off.

In order to understand the effect of wind, it should be remembered that an aeroplane is kept up by the reaction of the air on the under-side of the planes, and that the amount of this lifting force depends upon the speed of the machine relatively to the air, not relatively to the earth. When an aeroplane is credited with a speed of, say, 40 miles an hour, this means the speed relatively to the air which it must maintain in order to fly on a level course. Wind, so long as it is steady, does not affect the stability of an aeroplane to any great extent, unless an attempt be made to turn quickly. The real difficulty of the pilot lies in variations of its strength; a wind varying from 0 to 15 miles an hour is worse than one varying from 25 to 30. As a rule, the wind gets stronger but also steadier as one rises.

In a head wind the velocity of the machine relatively to the earth will be reduced, while a following wind will, of course, have a contrary effect. If an aeroplane with a speed of 40 miles an hour is flying in a head wind of 25 miles an hour, its rate of progress as measured from the earth will be only 15 miles an hour. Now suppose that the wind drops suddenly to, say, 10 miles an hour. The head resistance is decreased, but time is required to overcome the inertia of the machine; for the moment, it is still progressing at the rate of only 15 miles an hour,

¹ A Lecture delivered at the Staff College, 3rd November, 1911.

so that its velocity relatively to the air is reduced to 25 miles an hour. Unless the pilot alters his elevator, the machine will fall towards the earth. A reserve of engine power is obviously highly desirable in order to be able to accelerate quickly, but very few machines possess this advantage at present.

REMOUS.

Worse than the wind are the small local disturbances, especially the up and down currents of the air, all known as *remous*. These are of two kinds, heat *remous* and wind *remous*.

The mechanism of the former is but imperfectly understood ; in most cases they are probably due to the unequal heating of the surface of the earth by the sun's rays. A chalk soil, for instance, will get much hotter when the sun is up than a damp clay soil. Consequently, the air over the former has a tendency to rise more than that over the latter. Close to the point where the soil changes, there will be currents of air, downwards over the clay, and upwards over the chalk. These currents assume a spiral form, and the danger to the aeroplane is probably due chiefly to this spiral motion, and not so much to the upward and downward movement itself. Their effects are violent ; aeroplanes have sometimes been carried down as much as 300 feet in a few seconds, causing the pilot to lose his seat. They are generally encountered over a stream, and nearly always over a reservoir. They are seldom met with when flying over a uniform surface such as the sea. They are always present on a misty day, at the time when the sun begins to shine through. These *remous* are not of great extent, probably their width seldom exceeds 100 feet. They are not found in mornings and evenings or in dull weather, and are dangerous to a modern fast machine only in the middle of a hot sunny day. Birds make use of the upward *remous* in soaring. In summer, they are the cause of cumulus clouds and sometimes rise to a great height, 3,000 to 4,000 feet, but, as a rule, they are not much felt at high altitudes. They do not appear to come within 20 feet or so of the surface of the earth. Wind *remous* are caused by inequalities in the earth's surface, which form eddies and side gusts. Also, a wind striking against a ridge such as the Wantage Downs will be deflected upwards, while on the lee side of the ridge a downward current will be found. The level plains of Northern France are, for this reason, more favourable for flying than the greater part of England. Near some clouds, especially thunder clouds, a sort of whirlwind appears to exist ; this is very dangerous.

Every kind of movement of the air will be less felt the faster the aviator is travelling. At present, at any rate, there is no such thing as being "slow and sure" in an aeroplane. Speaking generally, we may say that safety lies in speed and height.

ASCENT AND DESCENT.

Stoppage of the engine merely means that the machine must come down. There is no danger so long as a landing place can be found. Some types must descend at a steep angle; this is a disadvantage, as it gives them a smaller radius in which to find a suitable spot. Other machines have a very gentle gliding angle; the Breguets and Nieuports have one of about 1 in 8, and, at a height of 3,000 feet, a pilot in one of these could choose his landing place within a radius of four miles. It is, of course, dangerous to fly across country at a low level, as this means a very limited choice of landing place. One thousand feet is a good average altitude for cross country flying.

In choosing a landing place for a machine, it must be borne in mind that the machine has to get out of it again. It is no good choosing a field surrounded by trees, and telegraph wires must be avoided. A meadow with short grass or a smooth stubble field in dry weather are all right for landing, but a ridge and furrow or a ploughed field will probably cause damage. With no wind, a fully loaded machine, with observer, could get off a hard level field in a length of 120 yards, and clear a fair hunting hedge at the end. Our Air Battalion "Farman" can do this in 90 to 100 yards, without any difficulty. With a head wind the distance required will be less, and if the ground is soft or covered with snow more will be wanted. Unless there is a gusty wind, a machine should be able to land in less than this space, but if there is such a wind the aeroplane may have to land at a high speed in order to keep steady, and, in this case, it would require perhaps 200 yards. If possible, a pilot will always land or rise against a wind. An aeroplane requires a clear width of about 30 yards when landing or getting up. It seems that, in an enclosed country like England, a machine is required that can rise rapidly and stop quickly after landing.

THE PILOT.

Stability at present depends almost entirely upon the action of the pilot, and the methods of control vary in different aeroplanes. A pilot highly skilled on one type may be quite incapable of driving another type except on a perfectly calm day, because, when the wind is at all gusty, all movements must be instinctive, and vary with different machines. It is very dangerous to expect a pilot to fly any aeroplane other than his own.

The muscular effort required to control a machine in a gusty wind is often considerable, and the physical fatigue of the pilot must be taken into account. A more important consideration, however, is the mental strain to which a pilot is subjected, due to the necessity of his keeping constantly on the alert for a sudden gust, and of listening to the running of the motor. It would appear that many accidents

are due simply to the mental fatigue and loss of will power of the pilot.

At present, it would be unsafe in war to reckon on a pilot going out more than six hours in forty-eight hours. Many machines are now fitted up with a dual control, so that the observer or another pilot can relieve the chief pilot, in which case the time might be increased; besides this, natural stability will no doubt be greatly improved in the near future.

OBSERVERS AND THEIR EQUIPMENT.

An observer must be trained and must have considerable experience in the air, so as to be able to use a field glass and make notes without difficulty, and to know what objects look like from above. He should have enough knowledge of aeroplanes to be able to pick out landing places, and to know when the motor begins to go badly. It is an advantage if he is able to drive. He must be able to start the engine. The feeling of giddiness due to height is seldom or never felt in an aeroplane. The effect is more like that of looking out of a railway carriage. It is only on a very gusty day that the rocking of an aeroplane is so violent as to cause sickness; under ordinary conditions an aeroplane keeps remarkably steady in the air, and there is not much vibration from the engine. It is most important to have nothing loose on one's person in an aeroplane, at any rate when the propeller is behind the passengers. In flight, the propeller tips are travelling at a rate of over 500 feet a second, so any small object hitting them will probably be hurled out with great force, and may very likely break a wire or even a spar. Besides this, as the propeller is made of wood, a piece will very likely be taken out of it, the propeller will be then unbalanced, and will probably burst owing to centrifugal action. This will often mean the destruction of the machine in the air. Movements of passengers, so long as they do not actually leave their seats, have no effect on the stability of an aeroplane.

It is inadvisable to have hooks on one's clothes, as they are always catching in wires, and it is a bad thing to have nails in one's boots, as they are liable to tear the fabric of the wings. An ordinary Field Service cap will be blown off. Some form of woollen cap fitting closely over the head and face is the best to wear. Even in the middle of summer it is very often cold in the early mornings up in the air. It is, however, possible to fly in very severe weather. Last February a Frenchman went 125 miles in 18 degrees of frost. I do not think that the effect of wind in one's eyes in an aeroplane is so great as in the case of a motor car travelling at perhaps half the speed; this is due probably to the absence of dust. Some people find goggles necessary.

A note book is very difficult to use owing to the rush of air, and a block is much better. There is no difficulty in writing on this usually. Pencils, writing block, map, and glasses, must all be firmly attached

to the observer. A wide-angle prismatic binocular with a magnification of 5 seems the best type of field-glass. An ordinary map case is usually sufficient, but for long flights a roller map case is necessary. This should be fixed to the machine.

A good plan for making rapid notes as to the position of the enemy is to have the tale of the map case slightly rough on the outside. The map can be seen quite easily, and pencil marks can be made on the tale.

FINDING THE WAY ACROSS COUNTRY.

Finding one's way by the map in the air presents little difficulty. The country looks exactly like the map, and a very large area in which to identify objects can be seen. Hills do not stand out at all, but any steep slope can always be recognized. Woods, water, and roads are especially clear. Railways are hard to see unless one is almost vertically over them, though the steam from a locomotive can, of course, be seen for miles. Churches, cemeteries, and windmills are conspicuous, and sometimes factory chimneys. The names of railway stations can be read with the naked eye at a height of 800 feet.

The ordinary $\frac{1}{4}$ or $\frac{1}{2}$ Ordnance Survey map is quite satisfactory for aeroplane work, but many countries, including England, are getting out special aeronautical maps; the index to the sheets of the German map shows that it will include the Eastern half of England.

Before doing a cross country flight it is a good thing to draw a bold line showing the proposed route, and to accentuate features that will show up; also to mark railways so as to distinguish between single, double, and four-line tracks.

Aeroplane compasses have to be specially made; the compass card usually floats in alcohol, and is then unaffected by the vibration of the engine.

The Clift compass has a small electric lamp for working by night. Very accurate direction can be kept by means of the compass alone. It is a good thing for the observer to carry a small wrist compass; Steward has a good pattern.

MILITARY POSSIBILITIES.

Now as regards their application to war. First of all, aeroplanes are only an auxiliary to the fighting troops; they cannot win battles by themselves. The extent of their utility is bounded by the limits of human vision, hence they are of little value in rain, fog, or darkness. They may sometimes bring back misleading negative information. Even with these limitations their value is very great. The latest types of machine can go up nearly every day. According to statistics furnished by the Meteorological Office, there were only twelve days in 1910 in which modern aeroplanes, with good pilots, could not have gone up for at least two consecutive hours of daylight. As the speed

of a modern machine may be reckoned at 50 to 60 miles an hour, this means that a general could make a practical certainty of being able to reconnoitre some 40 miles in front of his outpost line, and on four days out of five this distance could be doubled. Some weeks ago a Farman biplane flew 447 miles without coming down. Had this machine started from Dover at 5 a.m. one morning, the pilot could have reconnoitred Elsenborn Camp and have been present at a meeting of the Imperial Defence Committee in London by 6 p.m. Any of the machines that successfully come through the French trials now taking place, could leave the Staff College at 6 a.m., reconnoitre Tewkesbury and Evesham, and be back with their information before 10 a.m. The latest types of French military aeroplanes are generally fitted with three seats, and can take up a useful load of 4 cwts., in addition to the pilot and fuel and oil necessary for a flight of 200 miles. They would have no difficulty in taking up an observer, an assistant pilot, two rifles, and a light wireless equipment.

PERSONNEL IN WAR.

It is essential for good work that the chief air craft officer shall be in the closest touch with the Commander-in-Chief and with the General Staff; probably, he would be a member of the Intelligence Branch. All observers before going up should be given the fullest information as to what is known of the enemy, in order that they may be able to decide whether an unexpected bit of information is so important that they must give up their original mission.

All observers should have a good knowledge of strategy and tactics of all arms, and it is advisable that, at any rate, some of the pilots shall possess this knowledge, as there will be occasions when, owing to the wind, they will be unable to take up observers. Civilian pilots will be useless, except as messengers, unless their machines can take up an observer. The same pilot and observer should work together as much as possible; mutual confidence is of great importance.

The personnel from which to form pilots and observers must be selected with the greatest care. Weight, age, and even mechanical ability are of secondary importance. Men who take up flying simply for the pleasure of posing to the photographer, or of walking about with an aviator's helmet, will be useless.

It may be noted that scarcely any Life Insurance Company will accept flying risks on any terms. As General Roques, the head of the French Air Corps, says: "The aviator must look on death through a different pair of spectacles to other people." We want men who realize the dangers they must run, and that on service they will have to face death in a peculiarly terrifying form. Good nerve and a strong will are essential, but not necessarily a ready pen, a genius for detail, or a talent for commanding troops. A large air corps need not draw

away the best staff and regimental officers. I feel sure that the requisite type exists among the officers of the British Army. But we must offer sufficiently strong inducements to make the air corps attractive for them. Whether increased pay is in itself sufficient may be doubted.

Behind them we want first class mechanics and workmen to look after the machines. These must be picked men, as upon them depends to a large extent the efficiency of the machine. They must be given considerable experience in the care of the delicate engines they have to look after.

It would seem a good plan to have a meteorological expert on the Headquarters Staff, to forecast wind and fog. In 1910, the percentage of complete successes in wind forecasts was 63 per cent.

OBSERVATION.

Even at 500 feet the velocity of the machine interferes very little with observation, and objects can be kept in sight for a considerable time. In my opinion it is easier to see things at a distance of, say one mile looking diagonally downwards, than it is when looking one mile horizontally along the surface of the earth. This appears to be due to absence of dust particles in the upper air. In consequence of this, a man on the earth has to look through a mile of dust-laden air, while the observer in the aeroplane has to look through perhaps only 50 yards of it. This is also true in the case of morning mists, which seldom rise above 100 feet. Of course, this does not imply that the aeroplane will be less visible from the earth than *vice versâ*. However, according to an experience I had at Oxford, it seems easier to look downwards through a mist than to see up through it from the earth ; but I cannot say if this is invariably so.

Observation in war would probably be done at a height of 3,000 feet, in order to diminish the risk of being hit by the enemy's fire from the ground. I have no personal experience of flying at this height, as no Army machine could take an observer so high, but quote from that of the officers of the Air Battalion and from other sources. If there is a separate observer, and the aeroplane is within half a mile in a horizontal line from the object, it seems that even single guns will be spotted if they are on the move or in action, and a battery if only in a position of readiness or of observation. Any body of troops of over 30 men will be seen moving along a road, unless it is completely covered over by trees. Infantry in extended order show up on any level ground, plough, or grass, but on uneven ground, covered, say, with molehills or small gorse bushes, they would be very hard to distinguish. They would probably be invisible close against a hedge or in roots, but the first line transport might give them away. Shelter trenches and their occupants can usually be seen without much difficulty. In open

country without hedges, as in France or Belgium, a force, the size of a battalion, on a road could probably be located five or six miles off, but this would not always be the case in England. Where the roads run through woods, troops would not be detected till the aeroplane was almost vertically over them. Any movement on the ground is very visible from the air.

Woods afford good cover in summer, but it would be difficult to hide guns in a wood. A good deal can be seen in a fir or pine wood from up in the air. Houses, of course, give complete cover, but here again vehicles and horses might be a difficulty. In any case, woods and villages will not always be found in the right spot.

There is one point which must not be forgotten. It is impossible to conceal from the enemy the fact that he has been reconnoitred by an aeroplane.

Actual flying by night presents little difficulty ; landing is, of course, dangerous on a dark night, unless the landing place is lit up, say, by acetylene lamps or by oil flares.

About three weeks ago, an aviator in France went up at 10 p.m. and descended a few minutes before midnight. There was no moon, yet he declared that at a height of 500 feet he could distinctly see groups of men on the ground, and stated accurately where they were. The French have been experimenting with night flying. Dirigibles may be of great value for night work, as by taking advantage of the wind, they should be able to float silently over the enemy at a low altitude, using their engines to get back before daylight.

REPORTING INFORMATION.

As regards bringing in the information, a report may be written in the air, the machine can fly back, and the report can be dropped at Headquarters. This method will on many machines require a special apparatus to prevent the risk of fouling the propeller.

Wireless telegraphy has been successfully tried on a Farman biplane by two French officers, who, with an apparatus weighing 46 lbs., sent signals to the Eiffel Tower at a distance of 35 miles. Experiments over short distances have also been made on Salisbury Plain. At present, there is great difficulty in receiving messages on an aeroplane owing to the noise of the engine. Even on a dirigible the engines have to be stopped before taking in a message. This difficulty may be solved by having some type of visual receiver. The recent reports on wireless telephony at Cardiff are untrustworthy. In any case, it would be impossible to send messages by telephone from an aeroplane, owing to the noise. It seems pretty certain that wireless will be used in the future ; but it is doubtful if it will ever become the main method of sending back reports from the air, as if there are many machines trying to send back messages all at once, they would interfere seriously with one another.

Carrier pigeons have been successfully used from aeroplanes in France, and, I believe, in Germany.

Owing to their high rate of speed, it is probable that in many cases aeroplanes will themselves return to their army and land, so that the General Staff can have a personal interview with the observer.

A small mouth syren in an aeroplane can be heard on the ground at a height of 500 feet, and it is probable that some code of signals could be used between the aeroplane and the ground by means of a motor horn. This would be especially valuable for drawing attention to a message about to be dropped.

FIRING AT AEROPLANES FROM THE GROUND.

The problem of distinguishing hostile from friendly aeroplanes is a difficult one to solve. Naturally, a hostile aviator on reconnaissance will endeavour to conceal his identity as long as possible. Flags are very hard to distinguish. Any international agreement as regards painting the wings would be unfair, as some colours are more visible than others, and so the machines of one nation might afford a better target than those of its enemy. Trained look-out men would be able to identify the type of machine at a distance of two or three miles, but the same type of machine will be found in many different armies. It may, however, be noted that the type which is most common in the German army has a very distinctive shape of wing.

According to the School of Musketry at Hythe, it would be a waste of ammunition to use rifle fire against an aeroplane at a height of 3,000 feet. It is only a very lucky hit that would bring an aeroplane down; bullets could pass through the wing fabrics and do no damage at all. Even when the aeroplane is vertically overhead, a rifle would have to be aimed some 200 feet in front in order to hit it. According to the Italian papers, aeroplanes in Tripoli, when flying at a height of only 1,600 feet, have not been damaged by rifle fire. Ordinary field guns or Maxims would be of no use, but the Germans suggest one special high-angle gun with each company of Maxims or brigade of artillery. Even high-angle fire guns have very great difficulties to contend with. The angle of sight, the range, the direction, and the length of fuze will all be changing rapidly, and there will be no chance of correction by results. It seems as if some automatic gun, say a high-angle pom-pom, might perhaps do some damage, especially if it could fire a shell leaving a smoke trail and fitted with a very light percussion fuze. Then there is the question of hitting one's own side when firing at aeroplanes, as the latter will very probably fly right round and appear from the rear.

Bullets fired vertically come down with a velocity quite sufficient to disable a man, and the case of gun fire is, of course, worse. Perhaps the shell of the latter could have a time fuze, and be fitted with some

high explosive sufficiently powerful to break it into fragments so small that they would do no damage in falling.

To those who hope to carry out aerial reconnaissance, and look on the matter from a personal point of view, the question presents itself in a somewhat different light; the man on the ground cannot be certain of hitting the man in the air, but the latter will not feel quite certain that he is going to be missed, and the fear of a lucky bullet hitting the propeller will be ever present. Still, it is safe to say that even if special guns are brought out, this will not result in the value of aerial reconnaissance being diminished, but merely in the casualties among the air corps being increased. As one of our generals said the other day: "The particular form of death that falls to the lot of the reconnoitring officer is no concern of the commander."

AERIAL FIGHTS.

A struggle for the command of the air will, no doubt, be a feature of the next great war. One side is sure to start with an advantage in the numbers or quality of its machines, or in the ability and *moral* of its pilots, and it is inconceivable that the latter will rest content with a mere exchange of information, and not make determined attempts to prevent the enemy doing any aerial reconnaissance whatever.

Again, there may be occasions on which one side has little to gain by reconnaissance but has much to conceal, and in such a case the commander will no doubt allot to his aeroplanes the protective task of keeping off and destroying the hostile aircraft.

One aviator may endeavour to upset another by giving him the backwash of his propeller, or the observer may be armed with a rifle, and actual shooting may take place; this would present little difficulty. In either case the most rapid machine will have the advantage.

TRAINING OF TROOPS IN CONNECTION WITH AIR CRAFT.

If the air craft are going to be of any value in war, we ought to consider them in all branches of training and instruction, not only on manœuvres but throughout the year. Generals and their staffs must have practice in their use, and it would therefore seem unwise to keep them all concentrated in one locality in peace. The question of concealment of troops must be made a subject of systematic experiment. Then there is the question of the more suitable formation to adopt for reserves, in order to conceal their strength. Men must be accustomed to see aeroplanes flying over their heads. At present, I believe that every rifle within five miles will be fired off into the air at the approach of a hostile aeroplane. Or again, a few up-turned faces may give away a line of troops concealed behind hedges or in bushes. They must be accustomed to a sudden change of position after dark, and be taught that this is part of the scheme and not merely a counter-

order due to the commander changing his mind. We must practise tricks to deceive aerial observers; for instance, it might be possible to paint a screen laid on the ground, so as to appear like a gun from above.

There will be much staff work in connection with aeroplanes. Not only with regard to the allotment of objectives and areas for reconnaissance, but also as regards the transport for conveying petrol, temporary shelters, spare parts, and mechanics, all of which must be brought to the front, probably in motor cars.

BOMB DROPPING.

It is, of course, in reconnaissance that aeroplanes will find their chief value, but the Germans are carrying out a series of experiments in bomb-dropping at Danzig, chiefly for naval purposes. It has been proved that a weight of 100 lbs. can be dropped from an aeroplane in flight without upsetting it, but accuracy from any height is difficult to obtain. The Italians have obtained some success in dropping bombs in Tripoli.

I think a great deal might be accomplished by the moral effect of dropping a bomb into a bivouac by night, or even of letting loose a few star shell, certainly on troops that had been fighting for two or three days on end.

OUR HOME RESOURCES.

In war we must expect a casualty list of 100 per cent. every three months, in men and material, and must be prepared to replace all our pilots, observers, and machines at this rate. Among casualties in personnel, I include all those who lose their nerve.

On service, it is doubtful if more than half the machines would be in a condition to go up at any one time. Small repairs and adjustments are always being required, and engines want cleaning. A Gnome engine has to be taken down for cleaning after eight or twelve hours in the air, and this is a six hour job at least.

At present, we are too dependent on foreign firms for our machines. This source will, of course, be closed to us in war. The Army Air Craft Factory turns out excellent work, but does not get enough opportunity for training its men in aeroplane construction. The Bristol Company turns out a good many machines, and forms a valuable asset. Vickers may presently be able to make one a week. The output of other firms is very small; none of them could construct more than about one in a month. Altogether our national production is quite insufficient. The question of engines is still more serious. The average life of the cylinders of a Gnome engine is only about 100 hours, and it is generally agreed that a spare engine should be provided for each aeroplane. Except the R.E.P. by Vickers, the Green, and possibly the N.E.C. and the E.N.V., no successful aeroplane

engine is constructed by English firms, and these four are turned out only in very small quantities. Home production must be stimulated. This can only be done by Government action, for at present there is little demand for air craft from civilians.

EFFECT ON MILITARY OPERATIONS.

It is impossible to forecast exactly the effect that aeroplanes will have on war, but a few general tendencies may be indicated. Aeroplanes will be of greater value in strategy and grand tactics than for minor tactical operations; small bodies of troops may be concealed from them, but not large masses or marching columns; and an aeroplane is almost certain to be able to go out on any day, but not at any particular time of day. River lines, hills, and covering troops are no longer a screen for the concentration or for the movements of an army. A General will be able to have personal interviews with his reconnoitring officers, and will be able to send off members of his own staff to see the situation, or even to go out himself.

Then there is the moral effect on the Commander-in-Chief. Formerly a commander had to base his plan on information that was always meagre, usually out of date, and often contradictory. It required a man of very strong character to commit his whole army to action, relying only on a narrow margin of probabilities, or on his own powers of divination. But now a commander will no longer be shrouded in the fog of war; he will have facts on which to base his plan; like the director of a war game, he will be able to put on his map not only the position of his own troops, but of those of the enemy. Will there be the same opportunities for misleading and mystifying the enemy's commander and of crushing his independent will power by invigorous offensive? Has not all this increased the possibilities of the defensive-offensive battle? Will a commander hesitate as formerly to deliver his counter stroke?

Then the question of cavalry. If they are saved the fatigue of distant reconnaissance, will not their value be all the greater on the battlefield? May not the sight of an aerial battle so hypnotise the combatants below, that a few squadrons may be able to get within charging distance before they are discovered?

Will not the tendency now be to concentrate more power in the hands of the Commander-in-Chief and to allow less freedom to subordinates?

At any rate, it is certain that air craft will favour that side which is in the best situation to manœuvre, and so to take advantage of the information gained. As the Military Correspondent of "The Times" said the other day: "The service of aeroplanes, like that of quick-firing artillery, is not well suited to large bodies and slow minds."

THE FUTURE OF BRITISH MILITARY AVIATION.

In view of the great rôle open to aerial reconnaissance in war, it seems to me that this new weapon should be taken more seriously in our Army. Surely the supreme value of timely and accurate information gives to the aeroplane a value not much inferior to that of cavalry and artillery. Each of these arms is represented on the staff of the Inspector-General of the Forces by an officer who assists the Inspector-General in supervising the training given during the year. I think that the time has come for the appointment of a similar officer as Inspector of Air Craft, who would have under him not only the Air Battalion, but also the Air Craft Factory, and so be able to co-ordinate their efforts. A General Officer on the staff of the Inspector-General would be in a position to make certain that the training of the Air Battalion is in very fact suited to the requirements of the General Staff, and his standing and personal relation to the Inspector-General would insure that the wants of the Air Battalion are adequately represented at Headquarters.

In the British temperament are to be found all the natural characteristics essential for the successful aviator. We have a well equipped air craft factory with skilled engineers and mechanics, a body of scientists is now studying the question of flying theoretically, and there is any amount of ability and zeal among the officers of the Air Battalion, who, under most discouraging conditions, have been risking their lives daily on antiquated machines; and behind them there are numerous aspirant officers, capable of making good pilots. The mechanical ability and engineering resources of this country, once developed, are capable of making aeroplanes and engines as good as or better than any made abroad. With this great store of potential energy, we have all the elements necessary for producing an Air Corps unsurpassed by that of any other nation. But we may not have much time before us, and it behoves us all the more to make the most of the opportunities we now have.

MILITARY AVIATION NOTES.

1. Requirements for the ordinary international pilot's certificate :—
 - (a) Two flights, each consisting of five figures of eight, round two marks 550 yards apart.
 - (b) The machine after each flight to land with the engine stopped, and to come to rest within 50 yards of a fixed point.
 - (c) The height of 165 feet to be reached once.
 2. Requirements for the French military certificate, 1911 :—
 - (a) Three flights at a height of at least 990 feet, each flight to consist of a circuit round a point 31 miles away from the start without any intermediate descent.
 - (b) An examination on the motor.
- (1465)

3. The Aero Club of Great Britain have recently drawn up conditions for the grant of a special certificate. These are as follows :—

- (a) A cross country flight round a point at least 50 miles from the start. The point not to be indicated to the candidate till one hour before the time he elects to start, and the flight to be completed within five hours.
- (b) A separate altitude flight of at least 1,000 feet.
- (c) The candidate to glide from a height of at least 500 feet with the engine completely shut off, and to alight within 100 yards of the starting place.

4. Numbers holding pilot's certificate :—

Great Britain—					
Soldiers (Regulars) ...	...	...	...	...	43 ¹
Sailors ...	...	...	...	...	9
Others ...	...	...	...	...	117
France—					
Ordinary certificate ...	...	...	...	...	600 (about)
Military „ ...	...	...	...	...	50 „
Germany— ...	...	...	...	...	145 „

5. Conditions for machines which took part in the recent military trials at Rheims :—

- (a) To be constructed entirely in France, motor included.
- (b) To make a flight of 187 miles without a descent.
- (c) To carry during the flight a useful weight of 660 lbs., that is, in addition to the petrol, oil, and water necessary.
- (d) To have seating accommodation for three people.
- (e) To attain a speed of at least 37 miles an hour.
- (f) To reach a height of 1,640 feet in less than 15 minutes, with the full load as in (c).
- (g) To land in stubble, plough, and growing lucerne grass, and to rise from it again with the full load.
- (h) To be dismantled and put together easily, so as to be easily transportable by road or rail.

31 machines started in the competition :—

9 monoplanes.
20 biplanes.
2 triplanes.

The heaviest machine was the Antoinette monoplane, which weighed 2,062 lbs., empty. Its total weight in running order with full load would be about 27 cwt.

The average size of the biplanes was :—

Wing area...	...	...	...	505 square feet
Weight, empty ...	...	...	...	1,373 lbs.
Span ...	...	...	...	49 feet
Length ...	...	...	...	33 „

Out of the 31 machines, 13 were fitted with Gnome engines and six with Renault engines.

Some of the machines can take up useful loads of half a ton, and most of them have a speed of over 50 miles an hour.

¹ 24 of the soldiers were trained in the Bristol Schools.

Ten machines passed tests (e), (f) and (g) :—

Biplanes	...	...	...	...	2 M. Farman
					1 H. Farman
					3 Breguets
					1 Savary
Monoplanes	...	...	...	...	2 Deperdussin
					1 Nieuport

Their engines are :—

5 Gnome
2 Renault
1 Anzani
1 Labor
1 Canton Unné

The Nieuport has made the fastest time in test (b), doing the distance in 2 hours 34 minutes, or at a rate of 73 miles an hour.

6. Some recent records :—

Speed on a closed circuit Nieuport monoplane, 83 miles an hour. Speeds of over 100 miles an hour have been made on a straight course with a following wind.

Height Pilot only : Blériot monoplane, 13,944 feet ;
with passenger : Deperdussin monoplane, 9,800 feet.

Distance (pilot only)—

In one hour Nieuport monoplane, 74½ miles.

In one day Nieuport monoplane, 778 miles in 14 hours,
7 minutes ; three descents to refill tanks ;
total period on ground, 50 minutes.

Without descent ... Farman biplane, 447 miles in 11 hours,
7 minutes.

On the 12th April, Prier, on a Blériot monoplane, flew from London to Paris, 250 miles, without a stop, at an average speed of 63 miles an hour.

On the 5th September, a Breguet biplane started for the French manœuvres carrying the pilot and two passengers, their kit for manœuvres, and spare parts and tools for the machine ; total weight, 9 cwt. This, in addition to oil and petrol for a six hours' flight. It covered the distance from Douai to Rheims, 90 miles, at a rate of 62 miles an hour.

The following Table shows data of some Aeroplane Engines :—

DATA OF SOME AEROPLANE ENGINES.

Name.	Price.	Horse-power.	Revolutions per Minute.	Weight in lbs., complete with cooling apparatus.		Cylinders.		System of Cooling.	Consumption in lbs. per Horse-power per Hour.		Total Hourly Consumption.	Remarks.
				Total.	Per Horse-power.	Number.	Distribution.		Petrol.	Oil.		
R.E.P. ...	£ 560	60	1,200	330	5.5	5	Radial ...	Air ...	.48	.13	Lbs. 35½	French design, now being built by Vickers in small numbers.
N.E.C. ...	400	50	1,250	190	3.8	4	VEE ...	Water ...	.612	.03	32	English make and design.
Green ...	{ 265	35	1,160	280	8	4	Vertical...	" ...	.503	.16	23	
E.N.V. ...	{ 365	60	1,100	380	6.33	4	" ...	" ...	.55	.16	43	
	{ 350	40	1,460	250	6.25	8	VEE ...	" ...	.55	.13	27	
Gnome ...	{ 450	60	1,100	405	6.75	8	" ...	" ...	.55	.13	40	
	{ 520	50 ¹ , 44 ²	1,200	170	3.86	7	Rotary ...	Air ...	.59	.18	34	
	{ 833	100	1,200	220	...	14	" ...	" ...	...	...	...	
	{ 440	60	1,800	432	7.2	8	VEE ...	Air with fan ...	.7	.08	47	
Renault ...												French design and make.
Anzani ...	360	60	1,400	320	5.3	6	Radial ...	Air ...	.67	.12	47.4	
Canton Unné	500	80	1,300	330	4.1	7	" ...	Water ...	.46	.03	39.6	

¹ Nominal.² Effective.

NOTE.—The price of a Bristol biplane, complete, is £1,050; Nieuport, 2-seater monoplane, complete, £1,040; Breguet biplane, complete, £1,400.

X.

SOME NOTES ON AERIAL RECONNAISSANCE.

By CAPTAIN P. W. L. BROKE-SMITH, R.E., Adjutant, Air Battalion.

THE difference between reconnaissance from the air and ordinary reconnaissance on the ground is that in the former case the line of sight is at a considerable angle with the surface of the earth. This gives the advantage to the army employing air craft that ground features, *i.e.*, hills, woods, &c., can no longer be expected to afford the same concealment as they have in the past when aerial reconnaissance was not possible.

A co-existent condition of aerial reconnaissance, however, is that the line of observation from a height traverses a number of successive layers of the atmosphere. The state of the atmosphere affects the possibilities of reconnaissance. From above a certain height, say 3,000 feet, except when the atmosphere is very clear, objects on the ground become blurred and indistinct.

For purposes of military reconnaissance, exactitude of observation is, of course, especially desirable. It may be possible under certain weather conditions to find one's way, and to know one's whereabouts, but it may not, owing to the above causes, be possible to effect exact observations of military dispositions, &c. There is no doubt that a trained observer, and one who possesses natural aptitude for the work, can be relied upon to obtain good results from a military point of view to a much greater degree than can one not so qualified.

The efficiency which air craft have now attained renders it possible for flights to be made, and observers to be taken up into the air, on a very large number of days in the year. Moreover, on many days when unfavourable weather conditions, accompanied frequently by high or gusty winds, prevail during the greater portion of the 24 hours, there are very frequently periods immediately after dawn, and immediately before sunset, when two or three hours of excellent weather conditions render aerial work possible.

Taking into account the above three facts, *viz.*, that trained observers can take the best possible advantage of atmospheric conditions, and can be relied upon within reason to make very effective reports on the dispositions of the troops and on the country over which they are

despatched ; that flying is now possible on a very large proportion of the days of the year ; and that on nearly every day flying and observation are possible in the early morning and in the evening, the employment of air craft for military reconnaissance is now considered to be a practicable proposition.

With regard to the detailed observation of troops in the field, the following results may be expected to be obtained under normal atmospheric conditions and from a practicable altitude, i.e. from heights of 1,500 to 2,500 or 3,000 feet. The radius of observation from moving air craft from these altitudes may be taken to be from two to four miles measured from a point immediately below the observer. From greater altitudes a greater radius of observation is obtained, but objects on the ground naturally appear smaller and less distinct, and are more difficult to distinguish.

Troops in camp and on the march can be seen and their numbers estimated at considerable distances. A knowledge of the length of road occupied by various branches of a field army on the march, and the sizes and design of the camps of various forces of the hostile army aid the making of reports. Reports in some cases may be to the effect that a column of a certain length containing troops of certain types or arms has been seen in a certain place at a certain time moving in a certain direction, the head of the column being at a certain point. Or the area of a camp may be reported, and a rough sketch showing the arrangement of the tents, horse lines, &c., may be made. A knowledge of marked distinctions in uniforms worn by certain portions of the hostile forces, such as the costumes of Highlanders, Turcos, &c., would assist the aeronaut in describing a body of troops observed, and would aid the General Staff, who would know in what Division, &c., of the hostile army the particular body of troops was included, and would therefore be assisted in locating the distribution of the enemy's army.

Artillery in action, and cavalry in the open, are easily seen. Train, supply columns, ammunition columns, hospital columns, &c., are clearly seen. Massed infantry in the open are only fairly visible. Lines of infantry, especially in extended order, advancing or retiring on stubble, plough, or even grass, are very difficult to distinguish when dressed in khaki. Columns of infantry halted are difficult to see, especially if they sit down at the sides of the road.

XI.

RANGE FIRING AND BATTLE FIRING.

By MAJOR-GENERAL T. D. PILCHER, C.B., Commanding Sirhind Brigade, East Indies.

ONE of the chief objects of strategy is to place an army in such a position that its success in the ensuing battle will be an irretrievable disaster to the enemy, whereas its own defeat will only be of comparatively small significance.

The object of the tactics of generals is by various means so to utilize the forces at their disposal as to meet the enemy with superior power at decisive points, but the end of both strategy and tactics must be a bloody issue—the commander who thinks that he can win decisive battles simply by manœuvring is a danger to his country—and in the solution of the bloody issue by far the most important factor is fire.

At a conference held after some Continental manœuvres, an officer urging some strategic consideration was met by the Army Corps commander's reply, "His Majesty keeps three strategians, of whom I believe you are not one."

If, however, 100 able tacticians are required to every one able strategist—taking this word in its highest sense—1,000 men versed in fire tactics are required to every one capable of efficiently commanding a brigade. These are the men in whose hands the ultimate issue of a battle must rest; strategians and higher tacticians can only so place them that their victory will have the greatest results and will be rendered probable, but it is open to question whether in our Army these fire unit commanders, on whom so much depends, are in all cases as well trained as they should be. Stronger words might indeed be used without exaggeration.

Our Regular Army, taken as a whole, shoots quite well enough at a known range, and in this particular is probably in advance of the armies of Continental Powers. The ordinary prescribed musketry course, and the immense trouble taken generally by officers to reduce the number of third class shots, thoroughly effect this purpose. Too much stress cannot, however, be laid on the fact that it is infinitely

more important to have no third class shots than it is to have a large percentage of marksmen.

In the field, other conditions being equal, there is very little difference between the value of an ordinary first class shot and that of a King's Prizeman. The difficulty of judging distance, the difficulty of seeing a target, and the very discomposing effect of bullets flying about the firer's own head, eliminate the difference there may be between the fire of the two on a measured range in peace. If this assertion be true, it follows that it is from an active service point of view mere waste of time to spend hours on the range in re-gilding gold, and endeavouring to turn your first class shots, who already shoot *well enough*, into King's Prize winners.

As a popular measure, and if regarded as a pleasant outing, there is nothing against large rifle meetings, at which no men ever compete who are not already first class shots, except that a battalion, or a brigade, as the case may be, is struck off duty for a fortnight or more to mark, and that the competitors as well as the markers would, from a service point of view, be just as profitably employed in fagging tennis balls at a glorified tennis tournament at which the competitors were playing. Regimental and squadron or company rifle meetings, at which the object is to improve the shooting of the second and third class shots, are on the contrary to be much commended.

We are a very conservative people, and many soldiers who have made a fetish of range shooting will cavil at the above conclusions, which are opposed to many vested interests, and apply even more to the auxiliary than the Regular forces.

A certain general high standard of musketry is required, and this may be said to have been attained by a company which averages between first and second class shots. Where we fail, however, is in the proper tactical use of the fire of these efficient shots by the fire unit commanders, under which heading I include all ranks from the battalion commander to the lance-corporal. What is requisite is more training in this most important part of the officers' and non-commissioned officers' education. The more highly trained a unit, the more does it resemble a choke-bore in comparison with a company of third class shots which resembles an old-fashioned scatter gun with a large pattern, and if the captain of a good company gives a wrong range, or wrongly describes a target, not a single bullet will hit it, whereas a company of third class shots will probably fluke a few bullets on to it. A good weapon requires a good man behind it. There are, however, many other points besides the necessity of the accurate estimation of distance which enormously affect the results of fire in the field. These are correct fire tactics on the part of the unit commander, and fire discipline on the part of the troops, and if 5 per cent. of the result in the field depend on whether the unit consists of magnificent or only of ordinary good shots, 95 per cent. will depend

on these other factors ; and it is exactly in these points, which come neither under the heading of tactics, nor under that of musketry, that our fire unit commanders have much to learn.

The meaning in view can, perhaps, best be illustrated by a few examples. The difficulty of carrying out these or similar examples with ball ammunition in the United Kingdom is very great, and the acquisition of ground giving facilities in this particular would be an immense asset to the fighting value of the Army. It will, however, be obvious that in many cases the officer setting the problem will, if he knows the range, be able to gauge the probable value of the fire action of the unit, if the exercise be carried out with blank ammunition.

Example I.

“ A company is marching in advanced guard formation, with the nearest support three-quarters of a mile behind it ; on coming to a ridge the scouts halt, and the captain goes forward to see the reason of their halting. They point out to him a squadron of hostile cavalry off-saddled and feeding their horses on an open plain some three-quarters of a mile away. The ground they are halted on is green grass or wet plough, which looks as if it would not throw up dust. What action should the captain take ? ”

He should appreciate the situation thus :—The enemy do not see me, and will probably remain where they are until I show myself or open fire ; when I do open fire they will get away as quickly as they can. I cannot check the range, and shall be lucky if a quarter of my bullets are fired with the correct elevation. He should then quickly collect his command, line the ridge, and, either with a good range-finder or the eye, carefully estimate the distance, which, for argument's sake, we will say he takes to be 1,200 yards. He should then say, “ At the centre of the enemy's cavalry. No. 1 Section, 1,100 ; No. 2 Section, 1,150 ; No. 3 Section, 1,200 ; No. 4 Section, 1,250 ; Rapid Fire,” and open rapid fire, and when the squadron was galloping away should command each section to raise its sights 400 yards. Modifications of these orders might be just as good, but a great proportion of captains, if given this problem, will either open fire with the first section which arrives, will fire with all the sights at one elevation, though there is no opportunity of checking the range, and the target is a fleeting one, &c. There are many other ways in which this very simple problem can be unsatisfactorily solved, and no precision in carrying out badly-conceived orders can do more than accentuate their bad conception. It is the case of the choke-bore and the scatter gun.

Example II.

"The officer commanding a battalion in advance of a brigade which is a couple of miles behind him, has succeeded in driving in the enemy's advanced troops, and in gaining a ridge from which he sees that the enemy is in position at a distance varying from 700 to 1,000 yards. The battalion is occupying the front which will afterwards be taken up by the brigade; there are other troops to the right and left of the battalion. The ground around the hostile position is dry and sandy. Lateral communication under cover of the ridge is possible. What should the battalion commander do?"

He should say to himself, "It is impossible for us to advance from this cover until we have obtained a fire superiority, and this can only be done by the brigade, but I can get the ranges to the different points of the enemy's line just as well as could be done by the whole brigade"; and, acting on this conclusion, he should divide the front carefully between his companies, particularly warning them not to fire on to the ground allotted to another company whilst ranging is going on, and thus confuse the men watching for the splash of their own bullets. Whether the company commanders range by volleys¹, or by a few picked shots, must depend on the distance and on the ground. No artificial range-finder can compare for accuracy with the splash of the bullet when this method of range-finding is possible. When the brigade comes up, the different units composing it can be given the exact ranges, and effective fire can at once be opened. This exercise can be equally well performed substituting a company for a battalion and a battalion for a brigade. If any of the enemy's trenches are constructed in ground which will not show the splash of bullets, fire can sometimes be directed for ranging purposes at an auxiliary mark which will throw up dust and is near the target. It is often best to commence by shooting at such an auxiliary mark, such as a sand hill, a pond, or a living animal.

In three cases out of four in this problem the front is not carefully distributed by the commander, and the range is not properly obtained; and whilst the nearest part of the enemy's line is taken under severe fire, other parts are not fired at, and the troops located in these portions of the hostile position would be firing under peace conditions and inflicting terrible loss. Let us say that the enemy's position in this instance is represented by four distinct groups of targets marking his trenches, and in this case, in order to accentuate the necessity of taking the whole of his position under fire, it is well to give a value of one point to hits on that group of targets on which there are most hits, of two points to hits on that group on which there are the next most hits, of three points a hit on that group on which

¹ Bursts of rapid fire volleys are not now recognized.

there are the next most, and of four points to hits on that group on which there are the least hits. Any comparison instituted would be between one brigade following another as a whole, and not between parts of the brigade.

Example III.

“Place a section in a concealed trench and tell the commander that he may expect a hostile troop of cavalry, represented by a target, to come close past him in a direction which should be indicated.”

This target, if not fired at, appears at four ranges, the last being 200 yards (this, of course, the commander is not told).

In nine cases out of ten the commander will fire at the first appearance of the target, at 2,000 yards, and frighten the troop away without doing it any harm, just as used to happen in South Africa. Again, if on opening fire he finds he is going high or low, the commander will often alter his sights 100 yards, instead of, at a fleeting target, firing at the top or bottom of the target, if the range be approximately correct, and not altering the sights unless the alteration required be at least 300 or 400 yards.

Example IV.

“Two scouts, one a lance-corporal, have concealed themselves behind a bush, when they see four of the enemy marching in Indian file along a road which crosses about 100 yards in front of them. The road is concealed by a bank except for 40 yards to their immediate front. The scouts are told to try to get all four of the enemy.”

In nine cases out of ten the scouts will fire at the leading man directly he shows himself, and the others will not appear. What they ought to do is to wait until all four men are well in the open, and then to fire on the outside men who are nearest to cover, and thus, if they shoot straight, to get all four before they reach concealment.

Many other examples could be given in which, as is practically always the case on service, the proper action on the part of the fire unit commander is the important factor.²

All that has been written applies equally to Maxim guns, the fire control and fire discipline of which are in many instances neglected, but in the case of Maxims constant practice with ball ammunition is very requisite.

One of the most important items in fire control and fire discipline is skill and practice in pointing out and quickly picking up targets.

² A little book, giving more fire problems, will shortly be printed under the title of “Fire Problems and the Application of Fire in the Field.”

Every fire problem must be devised to illustrate some tactical principle, the violation of which will mean non-success, *e.g.*, in Example I the fundamental principles are concealment until perfectly ready to open fire with effect, the advisability of using rapid fire at a large and fleeting target, and the use of combined sights at a target the range of which cannot be checked.

In Example II the main points are the proper distribution of the target between the fire units composing the force, the necessity of obtaining the absolutely correct range when the point has been reached from which it is evident that fire superiority must be established, and the importance of taking the whole of the enemy under fire, so that none fire at you under peace conditions.

In Example III, retention of fire.

In Example IV, retention of fire.

An illustration has been given for a battalion reinforced by a brigade, but as much, if not more, value proportionately would be obtained by putting two companies in the place of the battalion, and the remainder of the battalion in the place of the brigade.

It is comparatively seldom that the extra expenditure of ammunition, required in problems in which more than a battalion takes part, is justified.

As was clearly pointed out at the commencement of this little article, its object is to lay stress on the necessity of the proper application of fire and the importance of fire discipline and control, to call attention to the fact that when men are already good shots infinitely more depends on these points than on making them super-fine shots, and to show the necessity of filling the gap there is in our training at the place where musketry ends and tactics begin.

The whole of the military art is one, and proficiency in one essential without average knowledge in another is of as little use as an otherwise magnificent horse with some radical unsoundness.

The different fire situations which can arise are not very many or very varied, but they require to be quickly recognized for what they are, and properly dealt with, and the battalion whose fire unit commanders are most proficient in these particulars will, provided the men be average shots, and their fire discipline be good, always be the one whose fire in the field will be of the most value. It is not necessary to say more, for campaigns are gained or lost by battles, and in battles the greatest physical quality is *fire*.

XII.

THE EMPLOYMENT OF CAVALRY IN COMBINATION WITH THE OTHER ARMS.

By MAJOR THE HON. W. P. RUTHVEN, D.S.O., Scots Guards.

EFFECTIVE co-operation of all arms in war can only be assured by a system of combined training in peace time.

The object of peace training must be to teach all ranks to assume the formation best suited to the effective use of their weapons. Courage and experience, unaccompanied by sound military knowledge, cannot lead to success. Moreover, such military knowledge must not be confined to the higher military commanders, but must be disseminated throughout all ranks of the Army, especially the subordinate commanders, so that intelligent co-operation, rather than mere mechanical obedience, may be assured.

We must beware in peace time of teaching hard and fast rules. All we can do is to lay down sound general principles for the training of our Army, and then, by careful supervision, without undue interference, see that these principles are put into practice. This supervision without interference is one of the most difficult tasks which falls to a commander's lot in peace time.

The firmer a commander's convictions on certain points, and the greater his knowledge, the more difficult it is for him to refrain from interfering when he sees the training being carried out not quite in the way he would have done it himself had he been in the position of the subordinate.

The only safeguard is to bear steadily in mind that there are many different ways of attaining an object, and that so long as the principle is not infringed, the actual method is a small matter.

Success in peace training, as in battle, depends to a considerable degree on the initiative of subordinate leaders, and nothing destroys initiative more than constant interference by commanders. The subordinate officer loses confidence in himself. His men find this out, and in turn lose confidence in their leader, and once this occurs discipline suffers.

We want to train our officers so that when left to themselves they will do the right thing. We want to inculcate in our men confidence

in their leaders, and a feeling that the system under which they are being trained is the best possible system that can be devised. This we shall never attain unless the officers who are to lead in war are given a very free hand in training their men in peace.

To get full value out of cavalry, its methods must be such as to admit of close co-operation with the infantry :

- (1) By providing the infantry with information.
- (2) By covering its movements.
- (3) By affording it active assistance on the battlefield.

These are the three distinct duties of cavalry, in relation to the infantry, and cavalry training in peace must be such as to ensure its carrying out these duties in war.

To carry out these duties, the cavalry with an army will, as a rule, be divided into :

- (a) Independent or strategic cavalry for the purpose of obtaining information as to the movements and strength of the enemy.
- (b) Protective cavalry for the purpose of covering the advance of the infantry and helping its movements.
- (c) Divisional cavalry forming part of the division for employment with the infantry advance, flank and rear-guards, and outposts.

The necessity for distinctly separating the duties of exploration and security was not recognized in 1870, and the principle was only embodied in our cavalry training in quite recent years. If the service of exploration is to be efficiently performed, the troops carrying it out must be free and unhampered by any necessity for covering the marching columns. This duty will be carried out by a separate body of troops, the protective cavalry. Circumstances may arise, such as weakness of one side in cavalry, which will compel the two duties to be performed by one body, or one body may have to reinforce the other. Or, when the opposing armies get close to one another, the two bodies may be amalgamated and placed under one commander. But, as far as possible, the two duties should be kept distinct from one another, and be carried out by separate bodies of troops.

The relative strength of the two bodies will be settled by the Commander-in-Chief.

“Correct and timely information is one of the main elements of success in war.”

Information may be obtained by :

- (a) A close study of the enemy previous to the campaign.
- (b) A well-organized service of intelligence.
- (c) A well-trained cavalry.
- (d) Airships and aeroplanes.

The intelligence service must be organized before the outbreak of the war. It loses half its value if it has to be hastily organized after

war has commenced. A good intelligence system can be of great help to the cavalry. The intelligence system obtains sufficient information to enable the cavalry to start in the right direction. The cavalry then has a definite mission, viz., to ascertain whether the intelligence is correct or otherwise.

One of the most striking features of the war of 1870 was the meagre use made of the French cavalry for the purpose of reconnaissance. From the 21st July, when Frossard arrived at Spicheren, until the 6th August, when he was driven back, not a single French horseman crossed the Saar. Again, on the 4th August, at Weissembourg, two squadrons of French cavalry were sent out to reconnoitre. They moved about a mile to the front, saw no Germans, and returned reporting all clear.

The Germans also, on several occasions, failed to make the best use of their cavalry. For instance, on the 15th and 16th August it was of the utmost importance to Moltke to know whether the French were marching west from Metz or were still clinging to it. Not one of the patrols sent out seems to have grasped this fact. None of them noted the direction in which the troops they saw were moving (a matter of vital importance), or estimated the strength of the several encampments, or reported the fact that certain roads were clear.

All this points to defective peace training. The French were so anxious to keep their cavalry for use on the actual battlefield that they omitted to train it for the equally important duty of reconnaissance. The Germans failed to recognize the fact that if good information is required from the cavalry it must be given a definite mission. It is useless to send out cavalry in a vague way to "reconnoitre." It must be told definitely the points on which information is desired.

The fourth method by which information may be obtained in war is by means of air craft. The great strides which have been made of late in aerial navigation, and the attention which has been paid to the subject by Continental military Powers, must not be overlooked by us. The recent establishment of an air battalion shows that the matter is receiving attention, though more money must be spent than is the case at present if we are to keep pace with other countries in this matter.

Not only do we want more money for the *matériel*, but we want General Staff officers to take up this matter seriously. There is no need for the officers to become aviators, but they must be accustomed to going up in dirigibles and aeroplanes, and making observations and reconnaissance reports therefrom.

It is difficult as yet to estimate the extent to which the use of aeroplanes will affect the employment of cavalry. It is probable, however, that the two will act in close association, the cavalry escorting the air craft up to a certain point, and then, when the

opposition becomes too strong, sending up the air craft to fly over the heads of the opposing cavalry to ascertain what is taking place behind.

It must be remembered, however, that air craft in their present state of development are an uncertain source of information to rely upon. The results of 1910 and 1911 were obtained under exceptionally favourable conditions. The weather was fine, the country was suitable for ascending and descending, and there were no bullets. It must also be borne in mind that manœuvres only last three or four *days*, and that three or four *weeks* in the field under active service conditions will place a much greater strain upon our organization.

The protection of the main body, whether halted or on the march, is, as a rule, best carried out by detachments of all arms. For this reason our protective cavalry will usually consist of our mounted brigades, each of one cavalry regiment and two battalions of mounted infantry. The Japanese carried out this principle with great success in Manchuria. Their protective screen was composed of small detachments of cavalry and infantry—they had no mounted infantry—and proved practically impenetrable to the Russians.

The divisional cavalry are for the purpose of assisting the infantry in the immediate protection of the division. A purely infantry line of outposts, or an infantry advanced or rear-guard, is a very helpless affair without the assistance of some mounted men for patrolling purposes. All Russian regiments have in peace time 13 mounted scouts attached to the regiment. They are infantrymen, and are given cast cavalry horses to ride. These scouts were found so useful during the war that their numbers were largely increased, the men being mounted on country ponies. This plan of adding a few mounted men (or cyclists in a country of good roads) to each battalion would conduce greatly to the security of the main body, whether halted or on the march.

The presence of mounted men with infantry adds considerably to the pace at which a force can move. Prince Kraft estimates that had the German infantry, in 1870, not been assisted by the divisional cavalry, who did all the patrolling, they would not have averaged more than nine miles a day instead of the 18 miles they actually accomplished.

There is a school of thought which considers that under modern conditions cavalry will have very little chance of effecting anything on the battlefield. This school admits that cavalry can still obtain information and can secure the other arms against surprise, but argues that cavalry on the battlefield is a thing of the past. People who argue in this way seem to forget that the first and greatest principle of tactics is that success in battle depends on the effective and close co-operation of all three arms.

We study very carefully the close co-operation of infantry and artillery, but we rather neglect the question of how cavalry can best be used in conjunction with the other arms. The anti-cavalry school points out how little the cavalry effected in recent wars. But this does not prove that cavalry is useless. It merely shows that the question of how to use it had not been sufficiently studied, and that the cavalry was either not used at all, or was used under conditions that gave it but slight chance of success. The personal element enters very largely into the question of cavalry success or failure. It is significant that cavalry has been seen at its best only under certain commanders, no matter what its weapons or by whom it was opposed. What is wanted is a Commander-in-Chief who thoroughly understands its use, combined with a cavalry leader who is really prepared to lead it.

The conditions that make it possible for cavalry to act effectively on the battlefield exist to-day, just as they did in the days of muzzle-loaders. These are :

(a) Demoralization of the enemy.

(b) Surprise.

No one who has been for some hours under fire can deny that a long strain tells on the best infantry. This is even more the case to-day than it was 100 years ago. Men's nerves are not what they used to be. The stolid plough boy, who was too stupid to realize his danger, is being replaced by the "nervy," quick-witted townsman. Also, the modern fight is of longer duration, and therefore more exhausting. Once the men are physically exhausted, it is very easy for them to become thoroughly unnerved, and when they arrive at that condition, even the threat of an advance of some formed body, especially from some unexpected direction, will often have a very great influence on the fight.

This state of nervous exhaustion, or demoralization, is reached when one side or the other has obtained what is known as "superiority of fire." This expression may be defined as that period in a battle when men can expose themselves with comparative impunity, and without having a shower of bullets round their ears. This is the time when cavalry will have their opportunity. It only requires a "push" to make the enemy go, and as soon as the "push" is given, cavalry must be at hand to confirm the "push" by chasing the retiring enemy, or by charging the reserves, as they come up to deliver the counter-attack.

The question whether the cavalry will be assembled in sufficiently large numbers, and in a suitable position to carry out these duties, depends on the leader. If he has been able to collect a force of cavalry near the flank of the opposing infantry, and has the courage and determination to launch it to the attack, then such an attack will stand an exceedingly good chance of reaping a great success.

To bring off a surprise against a well trained infantry is certainly more difficult than it used to be, because the increased range of modern rifles, and the increased depth of formations, make it necessary to take up a preliminary position at a greater distance than was formerly the case. But this applies more to the opening stages of the attack than to the later stages, when the infantry are lying within a few hundred yards of each other, with a storm of bullets and shells sweeping over them. Everyone is lying very low in the circumstances, and can probably only see a short distance ahead. It is also a well known fact that in the heat of an action it is almost impossible to get men to turn their attention to anything but the enemy immediately in their front. It is then that bodies of cavalry, by skilfully taking advantage of folds in the ground or other cover, can be brought up into favourable positions ready to charge when the moment arrives. There are very few countries where the ground will not admit of this being done.

The modern method of indirect artillery fire will often give an opportunity to an enterprising cavalry leader. This indirect method, though safer from hostile artillery fire, certainly renders the artillery more liable to surprise.

This question of surprise is a very important one. We see many instances, even in the days of flintlocks, of the complete failure of a cavalry attack on infantry. These failures can almost invariably be traced to the fact that the element of surprise was absent. Against intact and prepared infantry the cavalry charge was almost as hopeless 100 years ago as it would be in the present day.

But even against a surprised and demoralized enemy, a cavalry charge need not necessarily be successful. Cavalry, more than the other arms, depend on trained leaders. The leaders must recognize that if we are to win, losses must be incurred. Leaders must have "*la volonté à vaincre.*" They must recognize that war is a sacrifice, and must be prepared to suffer heavy losses. The non-recognition of this fact is perhaps one of the chief reasons for the cavalry failures of recent wars. Even the Germans did not thoroughly grasp this fact. Their losses amounted to only 3,000 out of the 63,000 German cavalry that crossed the frontier in 1870, and half of these fell at Rezonville. Napoleon lost as many as this in a single day at Eylau or Essling.

The truth is that as nations become more civilized they more and more fear heavy losses. They cannot realize that a short sharp campaign is more humane in the end than a long drawn-out struggle, and that it is better to incur heavy losses in one great battle, and end the war, than to allow it to drag on for years.

In order to obtain the greatest assistance from cavalry, officers of all arms should be taught to understand and appreciate its uses on the battlefield. We are rather inclined to look upon the

other arms as so many watertight compartments to which we have no access, and it is a question whether more could not be done to remedy this. It has been suggested that squadrons and companies might perhaps be trained together for a few days during company and squadron training, but this does not appear to be a feasible plan. The time allowed for company and squadron training is already so short, and so much elementary training has to be compressed into that period, that even a few days' combined training would seriously hamper the very important elementary work.

Other solutions that have been suggested are—

- (a) The attachment of officers to other arms more freely than is done at present.
- (b) A more extensive use of one-day tactical exercises without troops in which officers of all three arms should take part.

At present, if a brigade or battalion commander carries out one of these exercises, he gets officers of only one branch of the service. If one or two cavalry or artillery officers *of the right sort* were included, valuable instruction would be gained. By tactical exercises is not meant the regular staff rides in which officers of all arms are invariably included, but merely the one-day exercises such as we frequently have at the Staff College.

What we want to impress upon all officers is that it is the infantry that wins the battle. Artillery can win the battle by its fire only in very exceptional cases; it can usually only assist the infantry to close with the enemy. So with the cavalry. It can only assist the infantry. It cannot by means of a charge carry the enemy's position. The action of cavalry during a battle must be devoted to assisting the infantry by every means in its power. It must, therefore, keep in close touch with the infantry, and must remember that, in order to win the battle, the real and main object of its attack must be the enemy's infantry. To break through the enemy's infantry at some one point is the decisive stroke of the battle, and upon that one point the efforts of all should concentrate.

This principle has often been overlooked, and cavalry have been employed in wide turning movements round the flanks, or in raids against the enemy's communications.

A well-known instance of cavalry being used in this manner occurred at Chancellorsville. When Hooker commenced his forward movement, he retained only one brigade of cavalry with his own force, and sent the remainder, under Stoneman, to make a raid on the Confederate communications. Stoneman carried out his orders efficiently. Portions of his force penetrated to within three miles of Richmond. Hanover Junction was destroyed. A train full of Confederate wounded was captured, and a considerable amount of damage was done to the railway. All this, however, had no effect on Lee, who was not to be diverted from his purpose. He realized

that, provided he defeated Hooker, the damage done by the raid mattered little, and, accordingly, he devoted all his energies to the main purpose in hand, and refused to detach a single man to deal with Stoneman.

The only person who suffered from the raid was Hooker himself. He had deprived himself of the services of his cavalry, with the exception of the one brigade (Pleasanton's) mentioned above. This single brigade found itself opposed to the whole of the Confederate cavalry, and was naturally quite unable to make any headway against so vastly superior a force. Consequently, Hooker, when he arrived at Chancellorsville, was entirely ignorant of the enemy's movements or dispositions. Had Hooker kept his cavalry in hand, every track through the forest might have been watched, and ample notice given of Jackson's turning movement. Indeed, it is very probable that had the Union cavalry been in full strength, the turning movement would never have been attempted.

Another good instance of the defective use of cavalry occurred at Gettysburg. In this case, Lee committed almost the same mistake as Hooker at Chancellorsville. He sent Stuart off with the bulk of his cavalry to make a raid round the rear of the Union Army, keeping only one brigade, under Robertson, with his main force. Stuart's raid certainly created great confusion and panic in Washington and Baltimore. He cut the Baltimore and Ohio Railway and captured a convoy. But this made no real difference to Meade's plans, while the want of cavalry seriously hampered Lee. The Federal cavalry was strong and active and had the field practically to itself, and Lee was, in consequence, left without information as to the Federal movements at a time when such information was of vital importance.

It is true that Stuart eventually reached the battlefield, but his men and horses were exhausted after their long and trying marches, and accomplished nothing beyond keeping off a rather half-hearted attempt by some Federal cavalry to turn Lee's left.

In both these battles the results would have been very different had the cavalry been employed in close conjunction with the infantry.

Although shock action is not likely to be seen on a large scale, except on the flanks of a battle, small bodies of cavalry may get opportunities for shock action at different points all along the line.

A local counter-attack to regain some captured point, headed by a charge of cavalry and closely backed up by infantry and artillery, will have a much greater chance of success than the same attack made by infantry or cavalry alone. Take, for instance, Michel's charge at Wörth.¹ It is true it took place on the flank of the battlefield, but it was in the nature of a local counter-attack. Can anyone doubt

¹ See THE ARMY REVIEW, October 1911, p. 339.

that if Michel's horsemen had been closely followed up by a considerable body of infantry, Morsbronn would have been recaptured? The French, by that period of the battle, had realized the value of this village, though they seem to have overlooked it at the beginning of the day. Morsbronn, again in French hands, could have been used as a pivot of attack against the left flank of the Germans attacking across the Sauer from Gunstett towards Albrechtshäuserhof. The Germans would have been seriously embarrassed by an attack from this direction, and would in all probability have found their left held up, as was their right and centre. As it was, no one on the French side seems to have made any attempt to back up Michel. He made his charge; it failed, and there the matter ended.

We see the same thing occurring on several other occasions, notably the charge of the 3rd French Lancers, about 12 noon, at Rezonville. There were only two German battalions opposed to this regiment, and if the charge had been supported by some French infantry, in all probability the Germans would have been driven off the field. Although the order to charge was actually given by Bazaine himself, he made no attempt to support it, and the results in consequence were negligible.

It ought to be an understood thing that local counter-attacks should be made by all three arms combined, and not, as is usually the case, by infantry or cavalry separately.

Cavalry will usually be employed on the flanks, the large masses at all events; not wide on the flanks, not out of touch with the other arms, nor out of reach of the decisive point at the decisive moment.

Even now, this tendency to get out of touch with the other arms requires to be carefully guarded against. At almost every staff ride or war game one sees cavalry being sent off on some wide turning movement, quite out of touch with the rest of the army. Possibly this tendency may be the result of some confusion of thought regarding the rôles of independent cavalry when the two sides are far apart, and of the same cavalry when the battle is joined.

If the cavalry of both sides are employed in wide turning movements, a separate battle between the two cavalries may take place far away from the point where the main decision has to be come to. Even if the fight is successful, and the enemy's cavalry are defeated, our own cavalry may be so far away as to be unable to get to the main battle in time to be of use.

Even supposing the hostile cavalry are sent away on some independent mission, there is no occasion for our cavalry to go after them. They can be watched by scouts and officers' patrols, and, if necessary, a detachment told off to delay them.

The one thing our cavalry must not do is to allow the main battle to take place without taking part in it. It is a great temptation

to the cavalry to devote all attention to the enemy's cavalry, but it is a temptation that must be resisted at all costs. The mass of the cavalry *must* remain in close touch with the infantry, and not go wandering off on petty enterprises, which rarely lead to any decisive results so far as the main battle is concerned.

It sounds very well to talk of cavalry pushing round the enemy's rear, harassing him, and cutting off his retreat, but this is an unsound principle. One must defeat one's enemy first before one can "cut off his retreat." To do this, if the forces are at all equal, will require all three arms at the decisive point.

When the mastery is obtained, it is of the utmost importance to turn the enemy's defeat into a rout. Hustle and pursue him immediately. Give him time to get his wind, and he will soon succeed in organizing an effective rear-guard. Get him on the run, and he will not be able to do this.

As on the cavalry falls the duty of carrying out this hustling process, cavalry must be in close touch with the main battle, so as to be ready to act without a minute's delay. It cannot do this if it is 10 miles away on a flank.

If the cavalry are far away, the enemy has time to reorganize, and by the time the cavalry arrive, he will again show an unbroken front.

It may be said that if the cavalry are kept inactive during the greater part of the struggle, they are doing nothing. So also are the infantry reserves, and the artillery reserves as well, if any are kept. They are kept back until the right moment arrives. So also are the cavalry kept back. Simultaneous employment of troops everywhere by no means spells unity of action. It often spells dispersion.

It is by the employment of force at the proper moment that battles are won, not by employing it simultaneously all over the field.

XIII.

DEFENSIVE TACTICS.

By LIEUT.-COLONEL A. L. SCHREIBER, D.S.O., C.R.E., 1st Division.

GENERAL REMARKS.

CONSIDERATION of the defensive phase in field operations seems to have been to a great extent neglected, and attention to have been riveted only on the importance of the attack.

Doubtless the regimental officer and the individual infantry soldier require instruction chiefly in the development of the attack, and the preponderating advantages of the offensive have correctly been the all-pervading cry in the training of our Army, but the necessity also should be realized of practice in the study of co-ordinating tactical and physical conditions; how far to act on the defensive in order to utilize the advantages of a selected field of battle, and then how to determine the moment and the place at which the offensive should be suddenly and violently assumed.

It rather appears that apart from lessons in either direction to be learnt from foreign campaigns, the instinct of the attack being initiated from the commencement of operations has been instilled from our many recent wars against undisciplined or unorganized enemies, in constant campaigns in India, from the battle of Plassey to the latest expedition on the North-East Frontier, in Egypt, in Burma, in China, in East and West Africa, and lastly in South Africa.

Almost invariably the offensive has been assumed from the beginning.

This, however, was not the case in former days, when we were fighting disciplined troops; take the Peninsular War—almost any battle, Vimiero, Busaco, Fuentes d'Onoro, Albuhera—the enemy was induced to attack, and then at the psychological moment, the counter-stroke was launched; finally we come to Waterloo.

We fought as a rule on a selected battle-field.

Are we giving our minds now to the selection of such fields? Are we considering how best to adapt to our own use the physical conditions of any country in which we are likely to be engaged?

In these days of extended fighting, the choice of the engagement

zone requires infinitely more skill than in the days when a battle was fought and won in a so-to-speak ten-acre field.

CO-OPERATION OF ENGINEERS.

As a side issue, I should like to point out that the study of the above should be the particular rôle of the Engineer Officer, for it is in the preparation of such field of battle that the co-operation of the Engineers is particularly required, and the ignorance of the powers of such co-operation is very universal.

This is chiefly due to the fact that in peace manoeuvres, owing to our inability as a rule to do actual work, such as digging, clearing woods and fences, fortifying buildings, forming obstacles, etc., and also to the fact that engagements generally occupy about a quarter of the time that would occur in actual warfare, we cannot demonstrate our utility. Infantry and Artillery can fire off their rifles and guns, and can, at any rate, give an outward and visible sign of the semblance to actual fighting, but Engineers can make no "show."

As long as an attack is progressing favourably without physical or artificial obstruction, Engineers can be of little direct assistance.

Immediately, however, there is a hitch, and the overwhelming superiority of the attack is in doubt, their assistance may be required.

GENERAL PRINCIPLES.

To deal first with the general question of defensive tactics, we are all fully aware that an army acting wholly on the defensive has little chance of ultimate success; that in the "encounter" battle the conditions may entirely and suddenly change in all or in separate parts of the field; and that the attacker may hurriedly have to act on the defensive against a general counter-attack, or a local "offensive return."

Incidentally, as regards these local counter-attacks or "offensive returns," I am personally rather doubtful if their execution is properly understood. Judging from peace operations, there seems to be a tendency, whenever a portion of a force finds itself in a "tight place," for it to deliver a counter-attack (perhaps with a view to impress the umpires!), for the troops to leave what may be an excellent fire-position and make a frontal advance against an unshaken attacking enemy.

Unless such troops have a very strong chance of at least a temporary success, either from superiority of number or from a sudden surprise, or from the advantage of a flank attack, this seems a very dangerous proceeding. Unless the country is close, and the field of fire restricted, there seems nothing to be gained by troops trying to obtain a moral ascendancy by advancing in the open from a good

fire-position, in view of the fact that rifle fire is practically as effective at 1,400 yards as at any shorter range.

This digression is, however, quite apart from the general principle of deliberate and effective counter-strokes. It must be remembered that even when in alliance with another Power, we may be forced to act in the first case on the defensive.

For instance, it is understood that the German proposed system is to have a line of advancing masses which will concentrate on the battlefield, also that as their Empire can less easily stand the strain on finances than on human life, their object will be to terminate a war as quickly as possible by striking a knock-out blow regardless of losses.

The question is, however, whether in this calculation, the factor of human endurance has been sufficiently considered. Will the troops themselves stand the strain of partial annihilation?

There seems no reason why an opposing force, if taking every advantage of modern weapons, combined with a skilful use of the physical conditions of a selected field of battle, should not cause the practical destruction of a vastly superior attacking force. Why should the loss of 6,000 men in ten minutes, as at St. Privat, be a unique experience? It is true that this was chiefly attributed to the want of artillery support, but it also must be remembered that the French were safely posted behind enclosure walls with an ideal glacis in front, gently sloping down almost to the villages from which the Prussian Guard attacked. Why should not troops, if skilfully concealed and protected against artillery fire, again cause equal destruction?

I have not the statistics, but probably the losses of the Japanese were not far less than this, when they rashly and unwisely tried to take by assault the permanent or semi-permanent defences of Port Arthur.

As late as 1874, Von Moltke expressed the view that the improvement in firearms was to the advantage of the defensive, and that it would be much better to assume the offensive after several attacks of the enemy had been repulsed than to attack the enemy at great sacrifice. It must be owned that he never had to act on these principles, and was himself always able to retain the initiative from the outset.

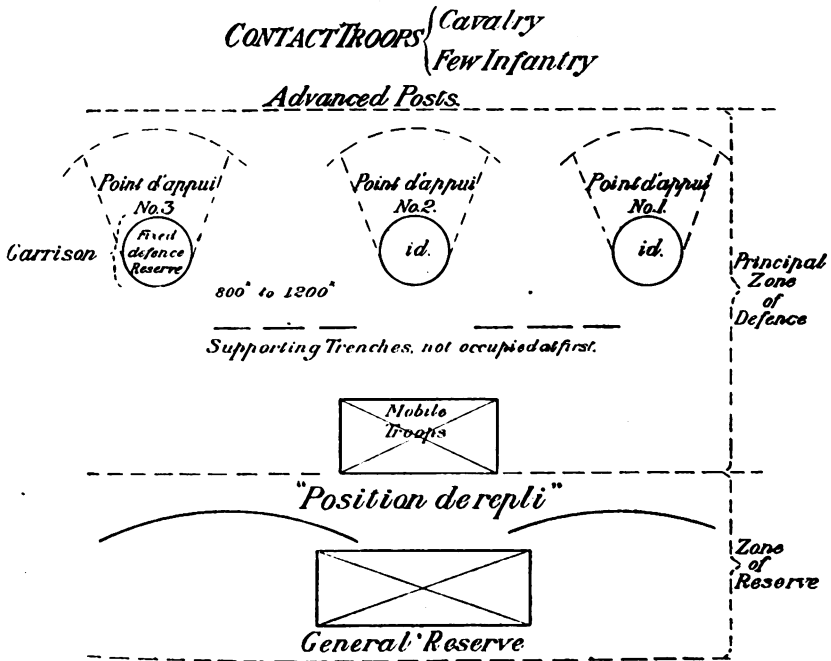
SYSTEM OF *Points d'Appui*.

The system with which I propose to deal seems particularly adapted to the preparation of a selected field of battle. If the enemy enters this zone, he is playing into our hands, and we should be able to deal with him on a preconceived plan; if he tries to work round this area, we have a defended screen behind and round which we can act with almost the whole of our forces; if he avoids it altogether,

the loss of time and labour in its preparation is comparatively small.

In a defensive position, the importance of an active defence has initiated the system of defended localities, or *points d'appui*, at convenient intervals along its front—these to be held by fixed garrisons so that the majority of the force may be left mobile, available to carry out general or local counter attacks, as opportunities occur, or to defend the intervals when necessary.

Before this system was mooted, the general principle was to place fire trenches more or less continuously along the front, wherever they could be concealed, and at the same time afford a good field of fire.



The importance of concealment which I shall constantly touch on remains the same as before, and the chief difficulty in the system of *points d'appui* seems to be that of combining concealment with a good field of fire, as it cannot be expected that natural means of concealment, at convenient tactical points, will always be met with in the exact positions from which the best fields of fire can be obtained.

I cannot help thinking that the vital importance of concealment, which was so forcibly impressed on us during the South African war, is gradually being disregarded. It does not seem to be always understood that this was the first great war in which smokeless powder was used. Before this, it was impossible to conceal the firing line, as

the smoke at once made its position visible, and to obtain the best field of fire was almost the only consideration.

In the only other great war since the introduction of smokeless powder, exactly the same experience has been obtained. It is known that the Japanese hold that half the value of defences is lost when their position is known. Therefore, in a fairly enclosed country where we have hedges, edges of woods, villages, etc., it is most important that their advantages in giving concealment should be fully utilized, even if the field of fire has to a certain extent to be sacrificed.

This system of a line of *points d'appui* was first, it is believed, initiated by the French, and several writers have written on the subject. The clearest essay, perhaps, is one by Captain Lenoble,¹ from which I have taken the diagram.

The system has also been studied in the German Army, and is now mentioned in "Infantry Training, 1911," just issued.

The system really is the adaptation of permanent fortifications, either from the old method of bastions along the front, or of the more modern principle of having redoubts, forts, or cupolas along a line of defence at such a distance apart that they can support one another by fire. The necessity of mutual support is the leading principle for the tactical situation of these points, and this is most important to remember, that each point should be supported by the fire of those adjoining, and should also be able to assist its neighbours.

I may say that, as the French word *point d'appui* not only means a pivot point in a military sense, but also signifies a fulcrum of a lever, a good deal is made of this double meaning by one French writer, who urges that by the use of a fulcrum or fixed point the strength of the power acting on the lever is considerably increased.

To go briefly into the system proposed by Captain Lenoble, we have first the contact troops whose mission naturally is to find out the enemy's movements, and, if possible, to draw him in the required direction.

ADVANCED POSTS.

We then come to the advanced posts; these are practically small outposts furnished from the garrison of the *points d'appui*. Their functions are:—To hold any good forward concealed positions, in order to watch the enemy's movements, deceive him as to the real position, to make him deploy and consequently delay him, and to prevent his concentration for the attack in any dead ground.

The chief principle is that the advanced posts should fall back before they are actually assaulted, so that they should not be driven back in confusion, and so, in any way, have a bad effect on the *moral*

¹ "Le Thème de Fortification."

of the *points d'appui*, or check their fire. This line of advanced posts is distinct from any idea of an "advanced line," or "false" forward position. I gather that this disposition, which presupposes a more obstinate and organized defence, is to be, if possible, avoided chiefly on account of the reason above, that the troops holding it might be driven back hurriedly on the main position, and so cause confusion there, and also mask its fire.

DETACHED POSTS.

I should now like to touch on a slight variation of the above system which I think might occasionally be necessary, and that is the employment of "detached posts." We often find, especially in a fairly close country, that there are small easily defensible localities along the main position which are not required for tactical reasons, but may be very desirable to be held locally, and these should, it is thought, be held by small (detached) posts, from the garrisons of the *points d'appui*. They should be very sparingly employed, but it seems folly to avoid natural advantages in order not to infringe on the principles of a fixed system.

POINTS D'APPUI.

The chief requirements of the *points d'appui* themselves is that they should be sited where there are natural advantages, and from which they can mutually support one another.

The garrisons of these should be divided equally between the troops forming the fixed defence and the internal reserve. These garrisons are to remain absolutely fixed in their localities. They are not to take any action except by fire outside their own defence. There seems some doubt whether their reserves should not take part in local counter-attacks or offensive returns between the points, but it seems safer to stick entirely to the above principle. These internal reserves should, if possible, be placed so that they can support their firing line as occasion may require, but this is not always an easy condition to obtain. Depth in defence in these points is required, so that if the intervals are pierced, the garrisons will still be secure. These localities should never have defences all round, *i.e.*, be closed works, so that if taken by the enemy, the mobile troops can recapture them. This last qualification is not, however, in agreement with what is laid down in the "Manual of Military Engineering."

MOBILE TROOPS.

Behind these, in the principal zone of defence, come the mobile troops, which would be allocated to certain sections of the defence, comprising a certain number of points, and would be in the hands of the Commander of the Section. These would strengthen or construct

defences in the intervals, to be used or not as required, as long as their mobility is not impaired; the mobile troops not to be tied to them, but only to occupy them if required. These troops would include the artillery of the defence, and it is against the system to have any artillery in the *points d'appui*, though it might, in exceptional cases, be employed for fire at close range.

In rear of the principal zone of defence is the zone of the reserve, along which should be constructed, if there be time, a "*position de repli*," or position of retreat, a defensive line of *points d'appui* similar to the first (not what might appear to be trenches on the diagram). This is to be occupied, if necessary, by part of the general reserve, which is in the hand of the Commander-in-Chief, ready for any decisive stroke. Attention should be paid to the communications in rear in case they should ever become lines of retreat.

DETAILED NUMBERS.

To go into more detail, the points should be placed from 800 to 1,200 yards apart, the distance, of course, depending on the field of fire obtainable, which, in its turn, depends on the ground formation and the existence or not of physical obstructions. In fact, in very close country, as often occurs in England, it may be necessary to put them as close together as 400 yards, or even less; but in that case it may be possible to reduce the garrisons. It may be assumed, however, in any case, whatever the system of defence, that the numbers required on a front in a close country are much greater than in open.

To return now to what we may call normal conditions. Let us take an average of 800 yards interval, and assume that the frontage of each defended locality is about 400 yards, and has a garrison of 4 companies, 400 men, half in the firing line and half in reserve. Behind these we may allow mobile troops, say three times the strength of the garrison, 1,200 men. And if we give a general reserve equal to the troops on the principal zone, that is to say 1,600 men, we have a total of 3,200 men per 1,200 yards of front, or nearly 3 men per yard. We may thus well allow a general reserve of nearly double the troops in the defensive zone, without totalling more than 4 men per yard.

I think the above gives the general system of *points d'appui* along a defensive position, but the same principles exist in the encounter battle, and the strengthening and holding of any favourable locality will add greatly to the power of the mobile troops acting in conjunction. It is of the greatest value to a commander to know that, whatever the immediate issue of the fight, he has certain points on which he can rely to hold their own, at any rate sufficiently long for him to have ample time to support them.

WOODS.

To deal now in detail with the physical conditions which lend themselves best for the formation of *points d'appui*, we must first examine the question of woods.

Naturally much depends on the size, nature, and position of the woods, but in almost every case they will afford the required concealment of the defences and hidden communications. If the frontage is too great, the salients should be occupied so that they can flank each other, the parts not occupied being rendered impenetrable by obstacles and entanglements. If the edge is exposed to artillery fire, the front line should be carried back 25 to 30 yards, the undergrowth being cleared to give a field of fire. Even if there is no undergrowth, the position of the defences will be greatly hidden by the shadows cast by the trees above. In any case, if there is time to do the necessary amount of clearing, it will generally be preferable to put the defences at a convenient distance behind the actual edge. Communications must be cut; the main point is to mark clearly the direction of the communications.

As regards woods in front of the defensive zone which form "stepping stones" to the enemy, if they are too large to be cleared in the time, skill is required in entangling the front edge in certain parts to induce the enemy to "break cover" where he will be under heavy fire. It is better, of course, if there is time to make entanglements about 50 yards in front of the edge, so that the enemy can see them and be induced to "break cover" somewhere else. Although it is easier to entangle the edge itself, the enemy might be able to cut it unobserved. As a general principle, entanglements should be placed on the enemy's side of any dead ground that may be near the lines of defence. It is, of course, useless to place them in the dead ground itself.

HEDGES.

Hedges afford excellent means of concealing *points d'appui*. Even if the enemy believes a hedge to be held, he cannot tell what works, if any, exist behind, and very strong parapets, high enough to obtain the necessary field of fire, can be constructed with head cover, over-head cover, the necessary traverses, and easy means of communications. In fact, a work can be constructed which, without natural means of concealment, would be most dangerously visible. If hedges also exist on the flanks of the point, the nature of the work would still remain invisible, even if the intervals were pierced.

Most hedges will admit of standing parapets being concealed behind them, and it must be remembered that the same field of fire may most probably be obtained thereby, as from a low fire trench a hundred yards or so in front. It is also important to notice that

troops behind a standing parapet have a vastly greater sense of security against assault than if placed in a low fire trench.

Hedges in front must be cleared, if possible, and it is much more important that the field of fire should be clear in the immediate vicinity, say up to 400 yards, than at a greater range. It may in certain cases be desirable to leave hedges standing which run transversely to the line in order to break up the attacks, but not close to the defensive line, or they would interfere with flanking fire. As hedges exist in most parts of England, their importance for the concealment of defences cannot be too emphatically stated.

BUILDINGS.

Last, but certainly not least, we come to villages, homesteads, country houses, farms, etc., and I have kept these to the end because they involve to a certain extent controversial matter, *i.e.*, whether buildings themselves are to be occupied for defence.

Personally, I should say they certainly ought to be, but as in everything else, common sense is required. If there are only one or two prominent houses which are very likely to be subjected to artillery fire, and a good field of fire can otherwise also be obtained in their immediate vicinity, then let them only be occupied during the final stages of the assault.

It should be taken as a principle that all houses from which a field of fire can be obtained should be *prepared* for defence.

The new Manual of Military Engineering, Section 52 (1), is very guarded in its statement.

"Buildings, when not exposed to artillery fire, may be of great defensive value.

"They should not be held when actually under artillery fire, as they afford a conspicuous mark, and the danger from flying débris caused by shells is considerable; but if time and labour are available they should be prepared for defence and occupied when the artillery fire ceases."

In Section 27 on "walls," we find "walls should not be held under effective artillery fire, but may be utilized for defence after artillery fire has ceased."

It would, therefore, appear as if my ideas were rank heresy. I am, however, saved by the real meaning of "effective" artillery fire. When we talk about artillery fire in connection with buildings, we must remember that artillery firing material-destroying projectiles only can be intended, and this forms a small proportion of European field artillery.

This chiefly is high explosive shell from howitzers or field guns, which, if accurate, is without doubt very destructive; the proportion of these to shrapnel is about 1 to 6 in British and German armies; besides this, there is practically only percussion shrapnel, the effect of

which, after all, is very local. I understand that in the case of an ordinary house it will go through the front wall and blow a considerable portion of the next wall in rear, but I doubt myself whether its effect would be very great as regards the front wall, or the personnel immediately behind it.

The preparation of buildings and walls is very easy; loopholes or notches in the walls themselves, or in houses, the forming of loopholes on the sills of windows by piling up bricks or stonework. Buildings and walls thus prepared for defence are practically extemporized forts on the field of battle, as they afford the best possible protection against rifle and shrapnel bullets, and also, a very important point, against assault.

This view is supported by several French writers.

Captain Normand, in his "*Principes et thèmes tactiques*," quotes several cases where in August, 1870, hamlets were held against very heavy odds, and under severe artillery bombardment, and were only finally abandoned owing to the fear of being surrounded. For instance, on August 6th the French, although reduced to a handful of men, held the hamlet Elsasshausen under the fire of five Prussian batteries firing at 900 yards. They defended themselves in spite of the buildings having been set on fire in the main street which they had barricaded; they only fell back under threat of being surrounded.

We know well of the performance of the garrison of St. Privat on the 18th August, and the resistance offered at the farm of St. Hubert on the same day. The material-destroying artillery was doubtless not as effective as it is now, but those were the days of smoke-bearing powder, when every occupied window and every loophole could be distinctly seen.

It has till recently been the general principle to avoid buildings, and I think the chief reason for this was their visibility and the tempting target which they afforded. Now the enemy will not always know whether buildings and walls are occupied or not.

As Captain Klein, of the French Engineers, says: "The art of fortification does not consist of obliterating what the enemy *can* destroy, but in strengthening what he *must* destroy."²

Apart from the question whether main buildings should be occupied at once or at the final assault, almost all villages, country houses, and farms, have outbuildings, enclosure walls, palings, fences, etc., which afford either protection against hostile fire or concealment for defensive works. They thus afford all the main qualities of defence, good field of fire, concealment, protection against assault, easy hidden communications, and probably good facilities for counter-attack, also generally a good supply of water, an important item in a continuous contest.

² "L'étude du rôle du génie en campagne."

I would like to quote some cases of the effectiveness of villages for defence in the Russo-Japanese War. The first is in the fighting on the Sha-Ho, when the Japanese 10th Division made an assault on the night of the 11th-12th October on the San-Kai-Seki-San. At the foot of the northern part of this rocky height, called the Twin Hills, lies the village San-Kai-Schi. When the Japanese attack approached this village, it could make no progress, and fell back to seek cover and take up the fire fight. Their fire proving, however, ineffective, they presently arose again and attacked the trenches at the foot of the hills. Finally, the whole of the position was taken, but the Russians in the village continued to offer an obstinate resistance, their retreat being cut off. They were finally called on to surrender, and those who refused perished in the flames, as the village was at last set on fire.

There were many other cases in the fighting on the Sha-Ho; in fact, one can gather that the hardest fighting almost always took place at the villages.

For instance also, on the 12th October, at Nan-Kuan-Tsy, on the Shi-Li-Ho. On the 14th and 15th October, in the attack of the Japanese 3rd Division on La-Mu-Tun, which village was attacked in the most determined manner for the best part of two days.

Regarding the 18th October, we read in the German official account that "some localities like Liu-Tsien-Tun, Sa-Ho-Tun, in the section of the 1st (Russian) Army Corps, were almost changed into small fortresses by the clay walls of the farms and buildings being prepared for defence . . ."

Another striking case occurred when the Russians were attempting to assume the offensive and were attacking the left flank of the Japanese Army, lying south of Mukden. On the 26th January, the 14th Division of the 8th Russian Corps attacked the village of Sandepou, supported by other troops on both flanks. This village was at a very prominent salient of the Japanese line. Towards evening the Russians pushed into and finally occupied the village which they thought was Sandepou, and were then astonished to find at 500 or 600 paces further to the east a strongly fortified village, from which they were met with such a heavy fire that they could advance no further, and finally, during the night, they were ordered to evacuate the offshoot of the village which they had gained.

I think that it will be found that in all past history, whether ancient or modern, whenever buildings have been occupied, they have provided the means of offering a most determined resistance.

As regards the necessity of works affording physical and moral advantages against assault, I would draw attention to the translation (by Captain Piggott, R.E.), in the July, August, and September numbers of the "United Service Magazine," of an article by Captain Seki, of the Japanese Infantry, entitled "*The value of the arme blanche*,
(1465)

with illustrations from the recent campaign." In this he shows how all nations have learnt from the Manchurian War that it was the bayonet—almost entirely the bayonet—which finally decided the issue in practically all the fighting. Imagine, therefore, the advantage which a defender must have by day, or almost more by night, if an attacker has first to surmount a physical obstacle such as a wall or hedge.

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IN THE OPEN.

We then come to the fourth and last condition :

When tactical considerations may necessitate the placing of *points d'appui* on open ground, the only thing to be done is to make them as strong as possible, at the same time concealing their position and construction as much as circumstances will permit. In such a case especially, the free use of dummy trenches and works is most important.

It will be seen, to conclude, that the system of *points d'appui* gives the very greatest scope to skill and cunning in the selection and execution of defences. The skill in making the most of all natural advantages, and the cunning in deceiving the enemy as to our dispositions, or in making him attack over areas most unfavourable to himself.

XIV.

THE CO-OPERATION OF FIELD ARTILLERY WITH INFANTRY IN THE ATTACK.

By BRIGADIER-GENERAL F. C. BEATSON, C.B., General Staff.

GENERAL DU CANE'S article under the above heading in the July number of *THE ARMY REVIEW* is, perhaps, primarily addressed to officers of the artillery. It will be none the less welcomed by infantry officers. To these it gives an admirably lucid picture of the general working of the two arms in an attack, as well as sufficient details of artillery action. But besides and beyond these they will be glad to have the assurance, which the article contains, that the "efficient support" of their arm, without which the best skill and bravery of their men and themselves are bound ordinarily to fail, is receiving in the artillery the consideration which it merits.

Nevertheless, it is difficult to read the article without a certain sense of disappointment. What is the most that can be promised to the infantry during the fire fight? The reply General Du Cane gives is (see p. 103) that "the most that the artillery can do, then, is, having made full use of the means of communication available, to inform itself of the difficulties and requirements of the infantry, to afford them opportunities of gaining ground, by arranging its fire in suitable bursts, increasing in frequency and intensity as the enemy's position is approached."

Again on p. 104: "These considerations afford additional grounds for concluding that the infantry can best take advantage of artillery support during this period by the exercise of judgment on the part of their own officers, and that all the artillery can hope to do is to endeavour to create opportunities for them to gain ground."

I think infantry can legitimately claim more than this. Would it be unfair to summarize the above extracts as follows: "We (the artillery) will do the best we can for you (the infantry) in our own way, and you must make the best of it?"

General Du Cane at the conclusion of his article pleads for the full recognition by the artillery of the principle expressed in a French regulation that artillery has but one rôle, viz., to help by all means in its power the advance of the infantry. The principle is just as clearly

defined in Infantry Training, 1911, Section 128 (5), thus : " The object of fire in attack—whether of artillery, of machine guns, of supporting bodies of infantry, or of the firing lines—is therefore to make possible the forward movement of the attacking troops and the eventual assault."

It follows from this that in such a case the artillery must have no other object—immediate self-protection excepted—than the efficient support of their own " attacking infantry," comprising in this term all the various portions into which the infantry is divided, and such troops of other arms as are directly working with them.

Or, as Major-General Aylmer in an article in the July, 1910, number of the " Proceedings of the United Service Institution of India " puts it : " Independent action on the part of the artillery is dead ; from the first movement of a battle till the last, artillery must work for and *with* the infantry, and artillery officers must recognize the fact that infantry officers know their own wants better than they do."

General Du Cane's article interprets efficient support by artillery thus : " The measure of the efficiency of the support is the degree of effectiveness of the fire." Surely this requires amplification, because, looking to the object of the fire to be really effective, it must be directed at the right time on the right target, and the latter is that normally " whose fire is chiefly checking the advance."¹ What does this involve ? Necessarily ; the closest intercommunication between artillery and infantry in action, and that artillery commanders must place themselves where they can clearly see the progress of the infantry ; it involves also " distribution of artillery fire."

The writer of the article brings out clearly the necessity for both of these latter, but says little about the first, except perhaps to throw out a word of warning as regards too great reliance on means of intercommunication during the decisive phase—the assault—and rightly, because at that stage the time for communications has passed.

The amount of efficient support to the infantry, as outlined in the article, appears inadequate. It fails to suffice, because the connection between the two arms in action is not close enough, and this failure is, I believe, largely due to want of elasticity in the superior commands of artillery.

Judging from the article there appears to be none of that devolution of responsibility and command recognized in all our regulations as absolutely necessary to the proper working of subordinate commands in the higher organization of an army, and in that of infantry brigades and battalions ; nor recognition of the fact that once battle is joined, a superior commander can normally exercise his legitimate influence over the conduct of the units under his command only by means of the force he retains under his own hand for the purpose. To assign

¹ Infantry Training, 1911, 123 (6).

tasks to his brigades on the orders received from the general officer commanding, and to keep, should circumstances permit, so much as is possible of his command under his own hand, is the duty of the C.R.A. of a division. To attempt to give objectives for the fire of each brigade or battery is futile, seeing that such will constantly be altering, and that no one man, save under exceptional circumstances, could supervise a field of such extent. However perfect the means of communication are, to attempt to do so means delay and unsatisfactory support to the infantry.

How then is the efficient support required to be given ?

"The essence of success in this respect lies in the knowledge by those concerned of the doings of each other."² The area occupied by an attacking division is too great, leaving out of consideration its accidents, both natural and artificial, for one set of observers, however well posted, to keep the whole under view ; it is a moving area, and within it there is constant change. The support to be effective must be prompt and rendered in the proper direction. It can only be obtained by a greater dispersal of artillery and greater decentralization of its command. There seems no need to place these artillery units under the command of infantry generals, or to call them "infantry batteries" or "counter batteries," as proposed by some French writers. But once their tasks have been assigned, it is absolutely necessary to give their commanders—officers commanding brigades, or it may be batteries—full liberty of action in carrying them out according to ground and circumstances, provided they keep in the closest touch by all possible means with infantry brigadiers and, it may be, with battalions. Then will it be possible for them to know where the *right* target is. To support individual rushes may, as General Du Cane, says, be hardly possible, but the artillery commanders will know where the infantry are hardest pressed, and what is checking them most. Once they know this, we of the infantry can safely leave the rest to them, and be ready to take immediate advantage of the effect produced. Whether the guns are close or at a distance is generally immaterial, provided the shells are going over our heads on to the right target.

The necessity of constant intercommunication between all the parts of an army is of vital importance ; without it there can hardly be efficient co-operation. The means are elaborate and varied, and they must be used to the fullest extent possible. Looking to the strain on commanders in action, this points to the necessity of an officer with no other duties to perform being detailed to supervise it, even in the lower commands.

Doubts are often expressed as to whether such close intercommunication is possible in action. Judging from peace exercises and

² Field Artillery Training, Sec. 57.

manœuvres, the doubt is perhaps a reasonable one. But in war, affairs do not march so rapidly as they often do on the manœuvre ground, and there is more time to work a properly thought out scheme. Practice makes perfect. However thoroughly both artillery and infantry recognize their own and the other's rôles in action, however perfect the working of the means of intercommunication, there will not be efficient support unless the arms are really accustomed to work together.

If the learning of each other's methods and difficulties is left till war comes, it will then be too late. The fullest possible interchange of officers is a great guarantee for effective co-operation between the arms.

NOTE.—Brigadier-General Du Cane's article was written with a double object—(i) To apply the principle of "fire to support movement" to the supporting fire of artillery; (ii) to put an interpretation on the phrase, "efficient support" as applied to artillery supporting infantry.

The extracts which General Beatson quotes from pp. 103 and 104 of Brigadier-General Du Cane's article, were written with reference to the manner in which artillery fire can be applied so as to support the forward movement of the infantry. They show the limitations which are imposed on the value of the supporting fire of artillery by the conditions of the fire fight. The argument advanced is, that the artillery cannot support individual rushes, and that they should not aspire to dictate to the infantry as to when a forward rush should be made. The infantry must judge for themselves when to make a rush, because there are many other factors besides the supporting fire of the artillery to be considered.

It would appear from General Beatson's remarks that he has taken the extracts he quotes as intended to have a general application, whereas they were intended to have a particular application only.

As regards the need for amplification of the dictum that "the measure of the efficiency of the support is the degree of the effectiveness of the fire," pp. 105, 106, 107, and 108 of General Du Cane's article, on which certain incidents of the war of 1870 are discussed, are intended to supply such amplification, the argument being that it is not always necessary to push guns forward close behind the infantry, and that frequently more efficient support can be given by not doing so.

No doubt, but for considerations of space, General Du Cane would have dealt at greater length with the importance of shooting at the right target at the right time, close intercommunication, and distribution of artillery fire.

In stating that "the amount of efficient support to the infantry as outlined in the article appears inadequate," and again, that it "fails to suffice, because the connection between the two arms in action is not close enough," which he believes is "largely due to want of elasticity in the superior commands of artillery," perhaps General Beatson has not fully appreciated the significance of two passages in General Du Cane's article, viz. :—

"It may occur at this stage that temporary groupings will be formed, to which special missions will be assigned, and portions of his command will thus, for the time being, pass out of the immediate control of the artillery commander. These detached brigades or batteries will, however, always return to the fold when the special mission already alluded to has been accomplished." (p. 100.)

"The duty of assigning tasks to the artillery, or, to use the phrase which has

already been used above, forming temporary groupings with certain definite missions, devolves upon the commander of the force. But when once these tasks have been assigned, the duty of arranging for this distribution of fire on the various objectives devolves upon the artillery commander, and for him to perform this duty satisfactorily he must be in a position to appreciate the difficulties of the infantry." (p. 103.)

In these passages the desirability of close association between certain infantry formations and artillery units for the purpose of carrying out certain definite tasks is brought out, and this involves both decentralization of artillery commands and a due measure of elasticity. It also involves the closest possible connection between the two arms. In other passages, notably p. 103, para. 2, intercommunication in order that the artillery may be informed "of the difficulties and requirements of the infantry" is insisted on.

General Beatson favours the principle of the artillery commander exercising his influence by keeping forces under his own hand rather than by attempting to direct fire.

On p. 101, para 1, of General Du Cane's article, the principle of "economy of force" is referred to, and the regulation that "fire should not be opened with more guns than are necessary to accomplish the task in hand" is quoted: *vide* also p. 100, para. 3, "detached brigades or batteries will, however, always return to the fold when the special mission already alluded to has been accomplished."

This appears to constitute a recognition of the principle that General Beatson advocates. Again, there does not appear to be anything in General Du Cane's article to show that he advocates the direction of fire by the general officer commanding the divisional artillery. In the last sentence on p. 103, "but when once these tasks have been assigned, the duty of arranging for this distribution of fire on the various objectives devolves upon the artillery commander, and for him to perform this duty satisfactorily, he must be in a position to appreciate the difficulties of the infantry," the artillery commander referred to is not the general officer commanding the divisional artillery, but the senior artillery officer of the "temporary group," who, it is insisted, should be in the closest possible touch with the infantry that he is supporting. Perhaps General Du Cane might have made it clearer that this was his meaning.

This note has been added because, although at first sight there would appear to be some important differences of opinion expressed in these two articles, a closer examination seems to show that no such difference really exists.

XV.

THOUGHTS CONCERNING THE ARTILLERY COMBAT.

By LIEUT.-GENERAL H. ROHNE.

Translated from the "Artilleristische Monatshefte," July, 1911, by
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THERE is a considerable difference in the German and French artilleries as regards ideas concerning the conception of the artillery combat; this difference must influence the employment of artillery. In both armies there is complete agreement as regards the chief rôle—one might almost say the sole rôle—of artillery, namely the support of the infantry, but opinions differ as to how the task should best be carried out.

In the German Drill Regulations for the Field Artillery (para. 432), it is stated: "It is essential, when selecting targets, to engage those whereby the most effective support of the infantry will be ensured. The situation will decide whether this can be brought about by engaging the enemy's infantry or by preventing his artillery from exerting its full effect against our own infantry." Up to this point there is no difference in the interpretation of the French regulations. The same paragraph goes on to say: "As a rule, the hostile guns will be the objective at the commencement of an action. The less the distance becomes between the opposing infantries, however, the more important it is that the hostile infantry should be engaged." Para. 469 states: "In order to carry through the attack, it is of the highest importance to keep down the hostile artillery fire. So long as the opposing infantries are far apart, the artillery must seek, above all things, to gain superiority of fire over the enemy's guns. For this purpose as many guns as possible must be brought into action. If the position of the hostile artillery has not yet been determined, the fire of a few batteries may induce the opponent to disclose it."

The French regulations maintain on the other hand that, although the annihilation of the enemy is a desirable object, its achievement must in no case lead to a waste of ammunition, and further, that it

suffices merely to neutralize the activity of the enemy more or less. For this purpose a limited number of rounds is sufficient, though when occasion offers, ammunition should not be stinted; consequently, no more batteries should be brought into action than are required to effect the purpose, namely, that of neutralizing the enemy. Thus the greatest possible number of batteries will be available when the decisive moment arrives.

There is no question here of endeavouring to gain superiority of fire by bringing into action the largest possible number of guns. It will be difficult to induce the French artillery to disclose its position by the employment of a few batteries. The question of these batteries drawing fire will entirely depend on what they are firing against. If they are not firing at infantry or at headquarters' staffs, their fire may be simply ignored. This appears to be quite clear from the writings of certain French officers, who seem well qualified to comment on the regulations. According to their ideas, the artillery should merely support the infantry by engaging the hostile infantry, because it is the one arm that can decide the battle, or should direct its fire against those guns that are firing at its own infantry when batteries detailed for this duty have been prevented from carrying it out. A "reconnaissance by artillery fire" cannot hope to produce great results; if it is desired to draw the fire of hostile artillery, it can only be done by using infantry as a bait.

The fundamental difference between the German and French conception of the matter appears to me to lie in the fact that the German artillery seeks to bring about an artillery duel in order to destroy the hostile artillery, whilst the French will only engage in such a combat when it cannot be avoided, that is to say, when the support of the infantry cannot be effected in any other way. The German artillery hopes to obtain a free hand for the later phases of the fight by entering into a combat of annihilation with the hostile guns before its own infantry has become engaged with that of the enemy; the French, on the other hand, who do not believe in the possibility of arriving at decisive results by means of this artillery duel, prefer to endeavour to destroy the hostile guns as occasion offers.

These are really important differences with far reaching consequences, which should prove interesting and instructive to study and discuss. Let us, therefore, review these ideas, which have for their object the neutralization of the hostile artillery on the one hand, and its destruction on the other.

The French conception is that, as a fundamental principle, in every battle the first round from guns should never be directed against artillery, but always against infantry.¹ This appears to me quite

¹ The question whether staffs or cavalry should be fired on primarily, as an exception, does not affect the further procedure.

irrefutable, for to assume that hostile artillery is going to remain inactive in an open position is just as inadmissible as the assumption that artillery should direct its fire in any direction in order to draw the fire of the enemy in return. Such foolish behaviour cannot be resumed as a basis for an argument.

As soon as infantry, whether of the attack or defence, comes under artillery fire, it is the duty of its own artillery to support it, and this can only be done by directing fire on the battery (called "A" for short)² which is molesting it. According to French regulations, this battery "A" must in no circumstances change its target in order to engage the battery "a" firing against itself; it must, in fact, continue to fire on the infantry.

This is certainly a wise precept, for the natural instinct of self-preservation, inherent in everybody, might easily lead to engaging this dangerous enemy, and thus help the opponent in his object, which is nothing more or less than the extrication of the infantry from its difficulty. Earlier regulations, however, legislated for this, for they stated that the most dangerous target should always be engaged, which, in this case, is certainly the hostile battery "A." Moreover, before the introduction of shields, this policy was to some extent justified, for if the fire were ignored, there was a considerable chance of being destroyed in a very short time. To-day this no longer holds good, for shields have given guns the means of considerable resistance; they may suffer losses under shrapnel fire, but their existence is not entirely threatened. The new German regulations lay down, therefore, para. 364, that, as a general principle, those targets are to be engaged which are most dangerous to the infantry. A battery which changes from an infantry to an artillery target is, of course, always covered by para. 431, which gives a battery commander a free hand as regards change of target when danger threatens. It is, therefore, quite suitable for a case like this when a change of target is expressly forbidden.

Battery "A" should, however, be assisted by another battery "B," in a covered position directing its fire on "a." Such a battery would be in a more favourable position than "A" for carrying out the task, for the latter would have considerable difficulty in effecting a change of target under fire. The battery commander would have to reconnoitre the new objective, perhaps measure the switch with the director, give out the orders for the change, and have to range again. For this to succeed we must pre-suppose considerable presence of mind in the leader, and perfect fire discipline in the unit, characteristics which easily give way under fire. To remain engaging the old target with effective fire is simpler and more easy, for only perseverance

² The expression battery is not to be taken literally; several batteries firing at one common target may be understood.

in this direction is required. On the other hand, the situation of battery "B" is much more favourable. It is defiladed from fire, and has probably had time to make all preparations for opening fire in a position of observation; being in a covered position, it has all the advantages over battery "a," which that battery had over "A." Before effective fire can be brought to bear on it, it will have finished ranging.

The enemy will naturally bring a battery "b" into action against "B" in order to relieve his own battery "a," and so the game goes on, on both sides, till at last a battery opens fire, on one side or the other, which is so well concealed that even the flashes cannot be seen by the enemy, who consequently cannot tell whence the fire comes.

It must be specially noticed that the French regulations lay down that no more guns are to be brought into action than are necessary to achieve the result desired in the shortest possible time. One battery can engage a target with a front of 100 metres (110 yards) very effectively; and by employing sweeping fire, one of 200 metres (220 yards). Still broader targets would be, as a rule, taken on by two or more batteries, and it only remains to continue to keep down the fire of such a target which has been successfully ranged on. In such a case the target may be of considerable breadth. To employ more than one battery against a target with a narrow front is not to be recommended, unless frontal and enfilade fire can be brought to bear against it simultaneously. For this purpose, however, the batteries would have to be widely dispersed, and could only be employed in such a manner in a prepared position, where everything can be arranged beforehand. In practice, the effect produced by two batteries against a narrow target can be arrived at far better by one battery by merely increasing the rate of fire. This sounds a paradox, but is none the less true.

Naturally, effect depends entirely on whether ranging has been accurately carried out, and the prospect of achieving this is considerably greater when only one battery is firing. When two batteries fire, special arrangements must be made for them to range on different parts of the target, otherwise, mistakes will be made in observation by rounds getting mixed up, and the successful ranging of both batteries will be doubtful. When targets can be clearly seen and are engaged from an open position, there is less danger as regards this. When firing from a covered position, however, the first few rounds fired may be incorrect for line, and the rounds of one battery may easily fall into the zone of fire told off to the other and so cause mistakes in observation. On ranging being completed, effect can be sufficiently increased by raising the rate of fire, consequently, the question of bringing more guns into action appears quite superfluous.

According to the new French regulations, frontal fire—*tir progressif*—directed over a front of 100 metres (110 yards) against a shielded

battery with detachments in action, produced at practice the following casualties in *personnel* :—

Range.							Casualties.
2,000 m.	...	...	...	...	...	...	20 per cent.
2,500 m.	...	...	...	...	...	...	18 "
3,000 m.	...	...	...	...	...	...	15 "
3,500 m.	...	...	...	...	...	...	12 "
4,000 m.	...	...	...	...	...	...	11 "

For such fire 32 rounds are required, eight from each gun, and they can easily be fired, at the most, in $1\frac{1}{2}$ minutes.

It must, however, be admitted that under service conditions, this effect will be considerably less owing, either to the detachments being better concealed, or to the fire being distributed in error over too large an area. Moreover, we must not lose sight of the fact that this effect is obtained against targets corresponding to the old shields which had a broad open space in the centre. This open space has recently been closed, and better cover has therefore been obtained for the detachments. The effect in question may consequently be lowered by one-half, which even then must be considered satisfactory when we bear in mind that the first casualties amongst the people hit comprised the observation officers, who are the most exposed when carrying out their duties.

It may be argued that although, under peace conditions, comparatively few rounds fail to hit, in war the effect must be considerably less. This is obvious, and to a still greater degree, when extremely accurate shooting is in question, a condition which appears essential when the object in view is the annihilation of the enemy.

A fire which can produce from 5 to 6 per cent. of casualties in $1\frac{1}{2}$ minutes cannot be regarded as ineffective. If the *tir progressif* is repeated, the casualties may possibly be doubled, or the detachments will have sought cover behind the shields, and thus the object of the fire will have been attained.

With *tir progressif avec fauchage* the effect is lessened in proportion to the breadth of the area fired on and the number of rounds fired. If a battery engages a front of 200 metres (220 yards), 48 rounds will be required, and the effect will be about two-thirds of that obtained by *tir progressif* without sweeping.

The new German regulations say (para. 31) that shrapnel "promise to give considerable effect against the less protected numbers of the detachments of shielded batteries," but para. 91 recommends the use of shrapnel against batteries in the act of unlimbering or when just preparing to open fire, and the employment of common shell with time fuze "against batteries already in action. Projectiles of all natures with percussion fuze should be used against batteries in the open at medium ranges when the destruction of guns

and wagons can be counted on with a suitable expenditure of ammunition."

It would appear, therefore, that a battery commander should never use time shrapnel, for when will he ever get a chance of firing at a battery in the act of unlimbering? Such a chance is only possible for the horse artillery with the cavalry (though the French regulations advocate covered positions for it also) during a pursuit, or if the hostile artillery makes a hideous mistake. It cannot be assumed that an error of this kind, made by the Russian artillery in the first engagements of the Russo-Japanese War, will be repeated by an enemy of to-day, and there is just as little hope of being able to range on a battery which is itself making preparations to open fire, for in these days batteries only disclose their positions when they actually open fire. It is, consequently, a false situation to place targets, at practice, in positions which they could not occupy on service. For preliminary instruction during the first practices it is permissible to do this, but everybody must be quite clear on the point that the situation does not present service conditions. In this connection we must remember that the preparation for opening fire in well-trained batteries will be almost completed by the time the guns are brought into action.

If the regulations, at this point, prescribe that batteries already in action should be engaged with percussion common shell, I must not emphasize my determined antagonism to this procedure. I consider that the effect produced by this nature of fire from guns is inconsiderable, and, in any case, not considerably superior to that obtainable by shrapnel fire. For kneeling detachments I consider that shields give just as much cover as trenches do for infantry sitting, and it is well known how little this is even at manœuvres, especially when the men are crowded together. The angle of incidence of the steepest falling shell fragment is greater than that of the interior slope of the cover, but as only shell with a limited explosive radius give decisive effect, the number of effective rounds must be extraordinarily low. Just as little effect may be expected in frontal fire from a common shell, the explosive action of which is lateral and longitudinal. The light field howitzer is consequently the most useful ordnance for this purpose. I would refer, in this connection, to the essay entitled "Howitzer Questions" (October number, 1910, p. 276), in which I have discussed the subject exhaustively. If percussion common shell fire is really dangerous, flank and overhead shields would be fitted to guns similar, for instance, to those adopted by Deport in his new field gun.³ In this pattern the two principal numbers sitting on the trail seats are completely protected by flank and overhead cover from splinters.

³ See "A new French field gun," January Number, 1909.

The destruction of guns and wagons is possible in existing circumstances by direct hits, that is percussion shell, but it is a question whether the expenditure of ammunition required to obtain the necessary effect is justifiable. This question cannot be answered by an unqualified affirmative; it is only when we have to deal with a battery, the fire from which is particularly dangerous, and which cannot be silenced in any other way, that such an enormous expenditure of ammunition is permissible, for owing to the long duration of battles of the future, economy in ammunition expenditure is essential.⁴ Although the French regulations (footnote to Section IX, 210) say that when firing against guns in the open at ranges between 2,500 and 3,500 metres (2,750 and 3,850 yards), from 6·7 to 4 per cent. of direct hits may be expected out of 15 to 25 rounds, no value can be placed on these figures which have evidently been calculated from the dispersion laid down in the range tables. For on service dispersion of fire is not only considerably greater, but the centre of the cone is generally a good deal wide of the actual point it is required to hit.

I consider it is wrong to expect artillery to destroy the enemy's guns. There are few examples known to me from past campaigns when batteries have been destroyed by artillery fire. When a catastrophe has occurred to a battery, it has generally been brought about by surprise infantry or machine-gun fire, which is equivalent to shrapnel fire. (Corps artillery of the IXth Corps at St. Privat, Austrian battery at Skalitz, von Groeben's battery at Koeniggraetz.) The Russian batteries at Wafankun collapsed under the shrapnel fire of the Japanese guns. It is sufficient, as has been proved in the past, if the hostile artillery is held sufficiently in check to prevent it from delivering an effective and well directed fire, and this may undoubtedly be achieved, as shown above in connection with the French system, by shrapnel fire, which will be highly effective against the unprotected parts of the battery.⁵

It was not so long ago that it was stated in authoritative circles—the German artillery without shields is well able to engage successfully the French shielded guns. It was said that a German battery, with an altered system of fire tactics, had put out of action 50 to 75 per cent. of the *personnel* of a shielded battery, in one particular instance with only 20 rounds.⁶ Now people decide against any effect of shrapnel fire against shielded guns.

⁴ See A.M.R., No. 8, p. 91, and No. 9, p. 185, in this connection.

⁵ Of the 60 French batteries which were in action on the 18th August, half did not lose more than 6 men from gun fire, that is 10 per cent. of their strength. This is a loss which can be effected by a well directed *tir progressif* in 1½ minutes.

⁶ See von Hoffbauer, "Old and New regarding German Field Artillery," p. 116.

If it is true that, according to the Instructions for Field Artillery Fire, decisive effect in the artillery duel can only be obtained by the use of time or percussion common shell, we are brought face to face with new changes for the artillery. Owing to the resisting power of shielded batteries, it is no longer possible to carry through a successful artillery duel with the few common shell now carried for field guns in the light ammunition columns. The supply of ammunition for the batteries and columns must consequently consist chiefly of this class of shell. We now come again to the conditions which obtained before the introduction of the 1891 shrapnel, when shrapnel and common were to be found in every limber and every ammunition wagon. The beautiful dream of the combined shell, scarcely affected by the few common carried in the store wagon and the light ammunition columns, consequently fades away.

We have never had any experience in our various campaigns of the disadvantages of being equipped with two different kinds of shell. The common shell was practically a combined shell; the few case shot, and the few shrapnel carried by a limited number of batteries did not affect the question. It is quite another matter now, for common and shrapnel are intended to be used in the future against quite different targets, the former against artillery, and the latter against infantry, and the lack of one projectile or the other may produce a very unpleasant situation.

The want of shrapnel when engaging infantry may very well prove fatal, but when firing against artillery it may be readily substituted for common. Replenishment of ammunition will be necessary twice as often as heretofore, and it may be quite impossible to carry out under hostile shrapnel fire.

I do not know whether the difficulties of replenishment of ammunition have ever been practically tested, but it is a fact that many, even senior, officers never give it a thought. Casting our eye through the ranging examples given in numberless books, we are struck with the facility with which the change from shrapnel to common fire appears to be made, as though, as at practice camp, the two kinds of shell were always to be found ready to hand in the ammunition wagons, whereas in reality they may be separated by many miles. In all such examples no mention is ever made of this point, notwithstanding the fact that, on service, it is of the greatest importance.

In order to engage a concealed battery effectively with common shell, it would be interesting and instructive to be quite clear on the question of the amount of ammunition and time which would be available.

It may be assumed that 1 kilog. (2·204 lbs.) weight of common will produce about 20 splinters.⁷ If the density of hits amounts to ·1,

⁷ See essay, "The Field Howitzer Question," October Number, 1909, p. 285.
(1465)

which means 5 per cent. of hits on standing figures, then 1 kilog. (2·204 lbs.) weight of shell must be fired against every 50 square metres (59·8 square yards) of vertical surface of the target.⁸

The area of a circle with a radius of 4 metres (4·376 yards) is about 50 square metres.

Therefore :

A 1896 field gun common shell covers an area of about 350 square metres (458·6 square yards), a light field howitzer common an area of about 800 square metres (956·8 square yards), and a heavy field howitzer common one of about 2,000 square metres (2,392 square yards).

When firing with shrapnel and a bracket of 100 metres (110 yards) is obtained, a zone 250 metres (275 yards) in depth is covered. If the front of the target can be located by the flashes and amounts to 100 metres (110 yards), a space of 25,000 square metres (33,900 square yards) can be covered. To obtain this result, 16 shrapnel rounds must be expended, or a weight of shell of 123 kilogs. (271·092 lbs.).

According to this, in order to cover the same zone with common shell fire, the following would be required :—

72 1896 field gun common ;

31 light field howitzer common ;

12 to 13 heavy field howitzer common ;

or a weight of shell of 500 kilogs. (1,102 lbs.), that is, four times as much weight as when firing shrapnel.

It is now easy to see that the dispersion of the common shell fragments will rarely be so systematic as is assumed here, and the effect will consequently depend far more on chance than is the case with shrapnel. A battery of six guns can, as I have stated in "Fresh Studies in Connection with Shrapnel," cover a front of 150 metres (165 yards) with shrapnel fire ; therefore, without increasing the expenditure of ammunition, it can actually effectively cover an area of 37,500 square metres (45,250 square yards). Under the same conditions, in order to arrive at effective fire with common, the amount of ammunition expended must be increased by half, that is six times the amount of weight of shell must be employed. It signifies little whether percussion or time common is used, though the effect of percussion fire is more dependent on the nature of the ground surface than time fire. The latter takes effect more laterally, whereas the former is effective in all directions, but the amount of space covered by both is about the same, provided the nature of the ground surface is not too unfavourable.

⁸ Let r be the radius of the circle, the density of hits on the circumference of which is .1 We get the equation—

$$\frac{20}{4 \cdot 2 \pi} = 0.1$$

$$r = \sqrt{\frac{200}{4 \pi}} = 4.$$

Should it be necessary to search in greater depth, as would usually be the case in engaging concealed targets, the number of rounds required to be expended of shrapnel or common will be about in the same proportion.

I will endeavour to give an example of the effect of fire of shrapnel and common against shielded guns, but I wish it to be distinctly understood that the numbers given are to be in no way taken as normal. They are only intended to illustrate the characteristic differences in effect, or, as the French so aptly put it, *pour fixer les idées*.

We will assume a field battery in action, taking up a front of 100 metres (110 yards) and against which an accurate 100 metre (110 yards) bracket has been obtained. Following the "Instructions for Field Artillery Fire," groups of shrapnel will then be fired at three different ranges. By firing one round in each group at each range the battery will have fired 18 shrapnel, the effect of which fire will in no way be less than the *tir progressif*, and will probably be greater, for the density of hits is considerably more. (See "Fresh Studies in Connection with Shrapnel," § 12.) It is doubtful whether the number of figures hit in practice will support this statement, for in the employment of *tir progressif*, figures which can be hit are, as a rule, hit.

According to Section IV, 197, of the French regulations, 15 per cent. of the detachments are hit in a shielded battery at a range of 3,000 metres (3,300 yards) by employing *tir progressif*, and it will depend very much on the nature of the target (size of the shields) whether greater or less effect can be obtained.

If percussion common is used, 42 of this nature of shell will be required in order to fire at least once at every range it is contemplated to fire at.⁹ But since, with the field gun, at least 72 rounds are necessary to obtain a proportionate distribution of the points of burst, it would be better to fire at once groups of two rounds each in order to save time, and to do this 84 rounds are necessary.

Of these 84 rounds only a very small proportion can be effective—I estimate the number approximately at four or five—for a single round has only a limited effect for depth. All shell bursting beyond the target has naturally no effect, and none can be expected from rounds bursting more than 20 to 25 metres in front of the target. Effect can only be hoped for from shell fired at the most favourable ranges. The effect of common shell bursting at an effective point of burst may, however, be very great, in fact, greater than that of shrapnel, for the effective zone for common is greater than that of shrapnel, and the density of hits is probably considerable.

* If a bracket 2,900-3,000 m. is obtained, shrapnel shell would be employed at ranges 2,800, 2,850 and 2,900, and common at 2,850, 2,900, 2,950, 3,000, 2,975, 2,925 and 2,875, provided the fuzes burn correctly.

For a similar reason the effect of 42 light field howitzer common will, as a rule, be superior to that of 84 field gun common. I say as a rule, for there is a good deal of luck when firing common.

In judging and comparing such effect we must consider the time and ammunition available.

Eighteen field gun shrapnel weigh 123 kilogs. (271·092 lbs.), and the same number of light field howitzer shrapnel weigh 230 kilogs. (506·92 lbs.); the time taken to fire this number is, estimated liberally, $1\frac{1}{2}$ to 3 minutes. As against this, the weight of 84 field gun common is about 580 kilogs. (1278·32 lbs.), and that of 42 light field howitzer common 660 kilogs. (1454·64 lbs.), and I estimate the time of firing to be 7 minutes.

Economically it is only possible to compare effect when the weights of the ammunition fired and the time of firing are the same. A continuation of fire with shrapnel will probably not perceptibly increase the number of hits on the figures; but it would be somewhat hasty to declare that, in similar circumstances, the effect of common is superior to that of shrapnel. Under service conditions the result will probably work out differently from those obtained when firing on the practice ground.

If men (namely, those who are the most exposed) are hit during one shrapnel series at the three different ranges, they must be replaced by others in order to carry on the fire, and these, in their turn, may be hit. The point must also be considered that one mortally wounded man, who cannot be removed, suffices to upset a detachment, and may create the greatest alarm and despondency amongst the remainder.

I suggest that, although the general effect of common shell is greater than that of shrapnel, in isolated cases it is not so in fact, and consequently the many disadvantages of taking two different projectiles into the field for field guns need not to be taken into account.¹⁰ The most serious disadvantage being the difficulty of ammunition supply.

The strenuous endeavour to annihilate the enemy's artillery will have further results which must be carefully weighed in the balance. The effect which a direct hit may have on an ammunition wagon filled with common shell must not be underestimated. It is of course not necessary that every direct hit should detonate such a wagon, but the possibility of its doing so must not be lost sight of. A few years ago this danger was regarded as so serious that the protection of the detachment by the ammunition wagon was not advocated.¹¹ I recommended at the time that common shell should only be used

¹⁰ With the light field howitzer the introduction of the '05 field howitzer shell has done away with these disadvantages.

¹¹ See essay, "Something in Explanation of Long Recoil and Armour" (Mil. Wochenblatt 10 and 11, 1903).

when there was no danger of being exposed to hostile artillery fire, and, consequently, only against infantry firing lines. Now, however, although this danger has not been lessened in any degree, common shell is the chief projectile to be used in the artillery duel.

In my opinion, the only way to obviate these difficulties is the introduction, even for field guns, of the combined shell, either common, shrapnel, or high explosive shrapnel. The field gun would consequently be just as effective as the light field howitzer. As a rule, time shrapnel would be used, and a neutralization of the hostile artillery would still be effected as heretofore. A valuable addition to the effect produced would be that of the head of the shell on a gun or ammunition wagon; for a hit so obtained would produce a possible effect by splinters on the detachment, and might easily destroy some of the laying accessories. Such effect would be similar to that of a direct hit. Further, when firing at a battery in the open with ranges equivalent to both ends and the mean of the bracket, the effect of common and shrapnel may perhaps be combined with the greatest advantage.

I consider that the effect of such fire will be superior to that of the light field howitzer if it is compared with reference to time and weight of shell.

APPENDIX.

In the foregoing pages we have only discussed effect against shielded guns with reference to the French regulations. I shall now give some examples from other sources.

In *Holland* a number of trials have been made in firing against shielded guns, not only with shrapnel and common, but with both natures of projectile together. The conditions were considerably different throughout; occasionally, single guns fired, and again whole batteries, sometimes under service conditions entirely, and at others the firing was controlled according to the observations communicated from the range party. I have arranged the results below in a comprehensive form:—

A.—FIRING WITH TIME SHRAPNEL.

Trial No.	Range.	Target.	Number of rounds.	Mean point of burst.	Effect.
1	Metres. 1,500	1 gun with unarmoured ammunition wagon— 7 men	15, of which 3 for ranging	Metres. - 14/1	2 men— 3 hits ¹
2	2,000	2 guns with armoured ammunition wagons— 14 men	10	- 90/4·5	No hits

¹ There were also 10 hits on all 3 men of the ammunition wagon; but the men were so placed, that if the wagon had been armoured, there would have been no hits.

A.—FIRING WITH TIME SHRAPNEL—continued.

Trial No.	Range.	Target.	Number of rounds.	Mean point of burst.	Effect.
3	Metres. 2,000	4 guns with armoured ammunition wagons in covered position—28 men	26, of which 8 for ranging	Metres. Low	5 men—8 hits
4	2,250	4 guns with 4 ammunition wagons in half-covered position—28 men	49	?	15 men—21 hits ²
5	2,500	3 guns with 3 wagons in covered position—21 men	30	?	Good ³
6	3,000	4 guns and 4 wagons in half-covered position—28 men	64	?	8 men—numerous hits ⁴

² See June Number, 1907, page 498.³ See January Number, 1911, page 52.⁴ Three screens destroyed.

B.—FIRING WITH TIME COMMON.

Trial No.	Range.	Target.	Number of rounds.	Mean point of burst.	Effect.
7	Metres. 1,500	2 guns and wagons—14 men	15	Metres. -10 to +5	Very great ⁵
8	2,000	2 guns and wagons—14 men	7	-3 to -12	None
9	2,250	4 guns and wagons—31 men, of which 3 in the open	46	?	22 men—numerous hits ⁶

⁵ Three direct hits.⁶ See June Number, 1907, page 498.C.—TIME SHRAPNEL AND TIME COMMON.⁷

Trial No.	Range.	Target.	Number of rounds.	Mean point of burst.	Effect.
10	Metres. 2,250	4 guns and wagons ...	{ 25 Sh. 14 C. }	Metres. ?	5 hits ⁸
11	2,400	6 guns and wagons, 1 gun visible—42 men	{ 24 Sh. 36 C. }	?	21 hits
12	2,525	4 guns and wagons ...	{ 18 Sh. 13 C. }	?	72 hits ⁹

⁷ No percussion common is mentioned in the trials; the author must mean *time* common or percussion common in table "C." (Translator.)⁸ Seven perforations in the shield; one wheel destroyed.⁹ Three shields penetrated.

C.—TIME SHRAPNEL AND TIME COMMON—continued.

Trial No.	Range.	Target.	Number of rounds.	Mean point of burst.	Effect.
	Metres.			Metres.	
13	2,600	4 guns and wagons in covered position — 28 men	16 Sh. 24 C. }	?	27 hits ¹⁰
14	2,600	6 guns and wagons in covered position — 42 men	26 Sh. 18 C. }	?	60 hits ¹¹
15	2,650	6 guns and wagons — 42 men	11 Sh. 40 C. }	?	123 hits ¹²
16	2,700	4 guns and wagons — 28 men	20 Sh. 40 C. }	?	67 hits
17	2,700	4 guns and wagons in covered position — 28 men	14 Sh. 18 C. }	?	65 hits

¹⁰ One shield hit by direct hit; one wheel and one axle damaged.

¹¹ Three wheels destroyed; two shields penetrated.

¹² Shields five times penetrated, once by direct hit.

The effect obtained by the trials under "C" is by far the greatest, and the most effect may be attributed to the percussion common. It should be stated that the whole of the trials were carried out with the greatest deliberation. For instance, the firing during trial No. 13 lasted 15 minutes, during trial No. 14, 20 minutes, and during trial No. 17, 17 minutes. (See May number, 1911, p. 385.) Such trials cannot be regarded as having been made under service conditions. The great effect obtained is explained by extremely minute corrections having been made in order to obtain the best possible bursts on impact. How much effect depends on chance is shown by trial No. 8, when 7 common shells, which burst close up to the target, did not score a single hit.

Let us refer now to a trial which took place with a 7·5 cm. Krupp quick-firing gun in Switzerland.¹²

The target was a gun and wagon with shields, the six men of the detachment kneeling. Range 2,000 metres. Thirteen shrapnel were fired, five being used for ranging, and eight hits were recorded on four men.

Two reports are available with reference to trials which took place with shrapnel fired from the 7·5 cm. Krupp gun on the practice ground at Tangerhuetten.

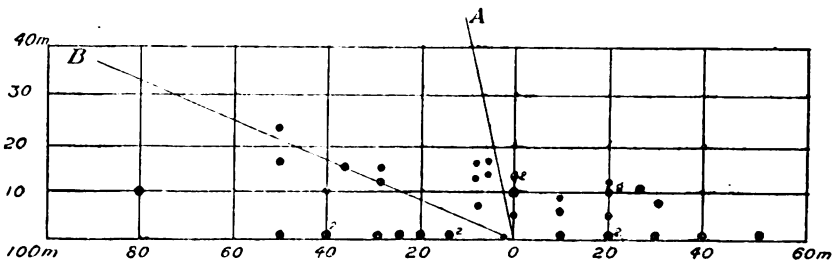
The target for the first trial consisted of four shielded guns and wagons with detachments of 32 men, set up with small intervals and distances at a range of 3,000 metres. Thirty hits were recorded on 10 men (that is 31 per cent.), using five percussion shrapnel, the

¹² See "Revue Militaire Suisse," No. 7, 1903.

mean point of burst being 86/11 metres. The shell weighed 6 kilogs. (13·224 lbs.) and was filled with 275 bullets, weighing 11 grammes.

During the second trial, practice was carried out against a shielded battery of four guns and wagons set up with intervals of 20 metres, with detachments of 32 men, at a range of 4,000 metres. Twenty-four rounds of percussion and 16 (two for ranging) of time shell were fired. The second and third guns were laid on; mean point of burst = 99/10 metres. Nine hits were recorded on five men (15 per cent.). One percussion round was a direct hit, which, however, only hit one man.

A similar target was then engaged with time high explosive common at a range of 5,000 metres. Fifty percussion rounds (seven for ranging) and 43 time were fired.



The diagram gives an idea of the distribution of the points of burst, but the calculation of the mean point of impact cannot be accurately arrived at, for so many alterations were made, with reference more especially to elevation, on the observations telephoned from the range party. If it be assumed that the angle of cover was 20 degrees, and that the maximum angle of descent of the splinters was 70 degrees, only the shell splinters falling within the angle BOA could be effective. Only nine out of the 43 rounds could really be considered as effective, and four of these were eliminated owing to the point of burst being more than 20 metres away from the target, the shell splinters being consequently too much distributed. The result was 11 hits on four men, and it is therefore not possible to talk of great effect in this case. To what extent the effect here depended on chance can be gauged from the fact that there were seven hits on one man.

Three trials took place on the practice ground at Tangerhuetten with the 10.5 cm. field howitzer, using time shrapnel against shielded guns.

At the first trial two groups of shielded guns, each with a detachment of four men, were put up in front of two screens with a distance of 30 metres between them. The four guns were close together, and the range to the first lot of guns was 1,850 metres. Twelve time shrapnel were fired with the following results :—

On the first lot of guns (mean point of burst 25-6·8 metres), 13 hits on 10 men (62 per cent.).

On the second lot of guns (mean point of burst 55-6·8 metres), 46 hits on 12 men (75 per cent.).

At the second trial two guns were put up with an interval of 16 metres, the wagons belonging to them being close together, Behind the shields were 18 men altogether, and the range was 3,000 metres. Ten time shrapnel were fired with a mean point of burst of 65-15 metres, and 38 hits were recorded on 13 men (73 per cent.). Four of the figures were entirely destroyed by the number of hits on them.

It should be noted that owing to the positions of the points of burst, some of the figures were hit by bullets passing through the spaces in the shields. No bullets flying over the shields scored a single hit. I mention this in order to refute the idea that the effect of shrapnel fired from howitzers is superior to that fired from guns, owing to the steeper angle of descent; the superior effect results from the greater density of hits.

If we compare the shooting of the field gun at 4,000 metres with that of the howitzer at 3,000 metres we find that, in spite of the steeper angle of descent in the trajectory of the howitzer, the density of hits is three times as great as in the case of field guns; a result of more bullets and narrower cone of dispersion. If the weight of shell fired from the field gun were the same, and the point of burst equally favourable, there is no reason why the effect should not be just as good.

Finally 10 time shrapnel were fired at a shielded gun and wagon with a detachment of eight men—three standing, two sitting, and three kneeling—at a range of 4,000 metres, the mean point of burst being 45-12 metres. Forty-two hits were recorded on seven figures, the standing figures alone being hit 30 times.¹³

The results are still better from the effect of the combined shell. I have before me six practice reports of trials with the 7·5 cm. Krupp field gun, and two of trials with the 10·5 cm. howitzer. The projectile was the well known common shrapnel which is fired as time shrapnel, the target being enveloped by the bullets, and effect being gained also by the head of the shell which travels on along the line of trajectory in the direction of the target.

At the trials with the 7·5 cm. field guns the shielded guns, with or without wagons, were put up in groups of four, with no interval, in front of screen targets. The guns and wagons were twice put up with normal intervals. The table on p. 154 gives the results of effect obtained.

In criticizing the effect, the fact that ranging was completed

¹³ See August Number 1910, p. 102.

accurately in each case must not be lost sight of. The effect obtainable must, under service conditions, have required at least three times as great an expenditure of ammunition, even when the target was in the open.

At the first four trials the guns and wagons were so close together that the target presented was four times as great as that presented by a battery in action at full interval.

The chief effect was obtained by the heads of the shell, which penetrated and destroyed one-tenth of the shields.

At any rate, we gather from this that the effect of common shrapnel is not to be under-valued, and may possibly bring about the complete destruction of a shielded battery.

Only two practice reports are available from the trials of the 10·5 cm. howitzer. The target was in both cases the same, and consisted of eight shielded guns put up close together in groups of four, with a distance of 30 metres between each group, and detachments of four men to each gun. Range to the first group was 1,850 metres.

One round was fired first with a mean point of burst of 90-10 to 120-10 metres.

In the first group one hit was recorded on one man, and in the second 12 hits on three men.

Subsequently, 12 rounds were fired at the same target, the mean point of burst being 70-9 to 100-9 metres. In the first group, numerous hits were recorded on 16 men (100 per cent.); in one gun a shield was penetrated by the head of one shell, and in another by a splinter. In the second group, numerous hits were recorded on 14 men (87·5 per cent.); and in three guns the shields were penetrated by heads of shell.

Range. Metres.	No. of rounds.	Target.	No. of figures.	Point of burst. Metres.	Figures hit.	No. of hits.	Matériel damaged.
2,000	10	Three sections of shielded guns at 5 m. interval and 20 m. distance	4 men to a gun. Total, 24 men	- 95/8 - 115/8 - 135/8	8 = 100% 7 = 90% 2 = 25% Total ... 17 = 71% 30 = 94%	182 32 2 216	Two wheels destroyed.
2,500	11	Four guns and wagons close together	32	- 42/6		*	Six wheels destroyed, large holes in shields.
2,550	5	Four guns close together	16	- 79/8	16 = 100%	*	One wheel destroyed, large hole in one shield.

* Uncountable.

Range. Metres.	No. of rounds.	Target.	No. of figures.	Point of burst. Metres.	Figures hit.	No. of hits.	Matériel damaged.
2,945	19	Four guns close together	16	-85/8·7	16 = 100%	*	One wheel de- stroyed, large holes in two shields.
2,855	87	Battery of four guns and wagons at 20 m. interval	32	- 11/2	31 = 97%	*	One wheel and one wagon de- stroyed, large holes in four shields.

* Uncountable.

From these various trials it is not possible to determine exactly which projectiles or methods of fire have the advantage. So much really depends on how long it takes to range, and when the effect is obtained. *A priori* it may be assumed that time shrapnel is the best nature of shell, and percussion common the most unfavourable ; and further, it cannot be accepted that time common has such a superiority over the other natures of projectile as to justify an alteration in the ammunition supply of batteries. Such a conclusion can only be arrived at by making further exhaustive trials, and, consequently, we must be very careful in what we decide.

At the first trials with high explosive common, tremendous enthusiasm was aroused for this class of projectile owing to the results of one particularly effective round ; this enthusiasm subsided equally quickly later on. The effect of this nature of shell is very variable, and is largely a matter of luck. A single round can obtain great effect, and the fact may be lost sight of that a number of rounds fired with the same elevation and length of fuze may not result in the same effect.

As long as the nature of the target (angle of cover and extent) is not exactly known, the question does not lend itself to any further theoretical solution. At the risk of being regarded as a confirmed theorist, I would suggest photogrammetrical pictures being made of the detachment of a shielded gun. Imagine the picture being taken at the ideal point of burst of a shell ; a clear conception of the extent of the target exposed would be obtained. A number of pictures would have to be taken from various points corresponding to the positions of the points of burst of effective common and shrapnel. As no good photographs could be taken at such a great distance as the length of burst of a shrapnel, the distance should be decreased, a corresponding deduction being made from the height from which the photograph is taken.

Photogrammetrical pictures taken of an infantry firing line, which were done in Italy and at the School of Musketry in Bavaria, were of the greatest scientific value. Similar pictures of shielded guns would be of equal value.

XVI.

AN ADDRESS TO TERRITORIAL OFFICERS.¹

By MAJOR-GENERAL E. C. BETHUNE, C.V.O., C.B.,
Commanding West Lancashire Division.

GENTLEMEN,

The text for my homily this evening, for I am afraid that my lecture has taken some such form, is from the Field Service Regulations, Part I, Operations, Chapter 1, para. 2.

“SUCCESS IN WAR DEPENDS MORE ON MORAL THAN ON PHYSICAL QUALITIES.”

A subject like this opens up such a vast field of possibilities for a discussion that the difficulty is to know which points to select as being the most likely to bear fruit. If I fail to do justice to such an inspiring theme, I must crave your indulgence, and relying on that, will proceed at once to my subject.

It may well be that we, as a nation, are becoming more and more unwarlike. Not that there is a lack of courage or pluck in the individual, but that, as a whole, our aspirations are towards a peaceful and, from a patriotic point of view, an ignoble life. Money and what money can procure has become our god, and commercialism, with its purely selfish ideals, bids fair to choke all higher sentiments of our duty to our neighbour and to our country. The life of a country has often been likened to that of a man. It progresses, by regular laws, from childhood to early manhood, then by easily marked stages to full manhood, and finally through senile decay to extinction. Overmuch wealth has the same debilitating effect on a country as over eating and drinking has on the individual. Both become surfeited and gross and a prey to any predatory microbe that may attack them. Not that wealth itself is to be despised; the trouble of a country that is degenerating is that the amassing of wealth by and for the sole benefit of the individual tends to place the interests of that individual above the interests of the commonwealth. When this becomes general a country is in a bad way, and the richer it is,

¹ Liverpool, October 19, 1910.

and the more possessions it has, the more likely it is to become a prey to a more warlike neighbour.

What we want to inculcate in the nation is a feeling that every man should be prepared to give *personal service* to defend his country, unless prevented by physical reasons. Universal service qualified by exemption on payment of a fine by those who will not serve is no use. From that system there is only a short step to the payment of mercenaries for the defence of the Empire, a step which caused the downfall of the mighty Roman Empire.

I will, with your permission, read you a short extract from a very clever and powerful book, written lately by an American, Mr. Homer Lea, entitled "The Valor of Ignorance." On pages 65 and 66 we read :—

"A nation can become so rich that its wealth will bankrupt it in a war with a country poor but frugal and warlike. Excessive national wealth is responsible for another factor, that even in itself is productive of utter incapacity to execute warlike measures or even to prevent the collapse of a nation in war—the enervation through luxury, feminism, theorism, or the decay of martial inclination and military capacity. . . . Wealth is a factor in the naval and military strength of a nation only so long as it is regarded in its true and subordinate capacity: to build battleships, but not to fight them; to buy arms, not valour; to manufacture powder, not patriotism. But when wealth becomes so paramount in a nation's life that it forms the chief ambition of individual efforts, then the factors that constitute military strength fall away. The only poverty from which a nation suffers in war is poverty resulting from the excesses of opulence."

Hear Mr. Lea once again. On page 62 he says :—

"Gold may harness men for war, but it has never been able to make them conquer when opposed to those whose discipline has been kneaded into the marrow of their bones and the inner chambers of their hearts."

It is such a character, gentlemen, that we want to instil into our citizens. It need not in any way interfere with our material prosperity, but without it our material prosperity becomes an illusion, and we shall merely amass wealth for other and more manly nations to garner.

I believe that medical science has evolved a scheme for introducing beneficent microbes into a man's system to combat those maleficent ones which dwell therein, thereby rendering the body healthy. Apply the parallel. What we want to do is to re-introduce into our youth and manhood, aye, and into our women, who need it far less than our men, by the way, the microbe of patriotism to combat the sordid microbes that now hold sway. At present we have in good health, from our point of view, just so many men as will bring our 14

Territorial divisions up to a little over three-quarters of their strength. I believe it to be our duty as Territorials, not only to perfect ourselves as far as possible in the arts of war, but to be active propagandists, all of us, officers, non-commissioned officers, and men, of the faith that is in us, and to do our best to bring others into the same way of thinking. There is no salvation for us unless the majority of our manhood will hold our views. Given that every man is a patriot, then my objection to money substitute for service vanishes; for the money will be given, not to evade service from base and selfish motives, but on patriotic grounds based on a genuine love of country.

I honestly believe that to introduce conscription into the country with the people in their present attitude of mind is to court disaster. We must begin at the other end, and try to convert people to the true patriotic view, and the political leaders will then be able to introduce such wholesome measures as they consider necessary for the defence of our Empire. If the people will not see the light, then we must follow in the footsteps of the great Empires that have gone before us, and make way for our betters.

I have dwelt longer than I should perhaps on these general views, which have been enunciated often before, but before taking up the more particular subject of my address this evening I wanted, as artists say, to "create an atmosphere," and to examine some of the forces which have moulded the character of our manhood for years past. Viewed through this medium it is easier for us to see where we, as soldiers, require to build up and strengthen our characters so as to make us efficient defenders of our mighty Empire.

Our characters are moulded by our environment to a great extent, and the environment of the professional soldier is totally different from that of the civilian. A man in civil life is brought up under certain immutable laws, or rather, what he has always thought to be immutable. If he is a country gentleman, his life proceeds in an orderly high class gentlemanly way, which he insensibly comes to look on as arranged under fixed laws which nothing can alter. If in business there will always be for him some one to call him in the morning, to cook his breakfast, and to brush his clothes. For him the 9.5 train will always run, and a cab will take him to his office on wet days, where his correspondence will await him and the day's routine. What a grievance! What letters to the papers when the 9.5 is delayed by fog! The whole day's work is thrown out of gear.

Now, when such a gentleman takes a Territorial commission, his whole nature and character must alter, and he must look upon life from a totally different standpoint. He and his command being one, there will be no 9.5 train to take him where he would go, but he must teach his men to march and lead them himself. No policeman will protect him in war, but he must rely on his military skill and the skill he can impart to his men to protect him in the day of battle.

Gone are all his old standards of life. Nothing is ordered or arranged by the municipality. He must learn to rely on himself, on his comrades, on his leaders, on himself most of all. Money will not help him in essentials, for everything in a military force depends on the skill, foresight, and intelligence of the force itself, which is compounded of the skill, foresight, and intelligence of the commander, of the leaders, and the men. Orders from superiors must be obeyed implicitly without cavilling. In short, the Territorial officer on service finds himself without any of the standards that guided him in his private life, and he must adjust his point of view and alter his character accordingly. He must learn always to expect the unexpected, to be prepared to find all his carefully thought out plans upset, and to be ready with a fresh plan at a moment's notice. He must cultivate presence of mind under stress, loyalty to his leaders and to his men; learn to accept responsibility, and to take a rebuke silently. He must look to his superiors for guidance as his subordinates do to him. He must know his work thoroughly, for this in itself breeds confidence, and not only know it parrotwise, but understand the true inwardness of it. He must not be too certain in his mind that the "common sense" way of doing it is the best way of doing it in all circumstances, neither must he cavil overmuch at "red tape" methods. He must be prepared to do without sleep, without food, to be chilled to the bone or scorched, and take it all in the day's work. To sacrifice himself for others, even to the extent of his life, and to have only one idea, that is, to keep the flag flying in all circumstances. To do all this is to be a good leader, and by as much as an officer falls short of this ideal by so much does he fall short of his duty. No book knowledge will make up for the acquired habit of doing one's duty in *all* circumstances.

I have frequently heard men in course of conversation say: "We would do anything for so-and-so; he is so popular." All well and good, and the personal factor has an enormous influence on soldiering, but the remarks seem to imply also: "If he were not so popular we would not be bothered to work for him." You must remember, gentlemen, that true discipline not only teaches us to do our duty when it happens to fall in with our own inclinations, but also when that duty happens to be an irksome one. A man, say, goes to camp prepared to do his work up to a certain point. If he gets tired or bored, or what is technically called "fed-up," unless his discipline is ground into his very system, he will grumble and, even if he does not actually rebel, make very heavy weather over his work. Now this habit, gentlemen—for in these flabby, half-baked days such attitude of mind has indeed become a habit—needs to be eradicated with a strong hand. There is not sufficient time in the Territorial's military year to teach him discipline as the Regular soldier is taught it, so he must ponder these things in his heart and try at *all times* to

strengthen his will-power and powers of concentration. His superior intelligence should help him to do this, but officers and non-commissioned officers by precept, and above all by example, should help to set his feet on the right path. It is the proper attitude of mind towards our duty that we all have to learn.

A Territorial soldier has also to learn the difference between a military crime and a crime in civil life. We all know the difference in theory; practice is a different thing. But—for I do not point out a blot without suggesting a remedy—let him once grasp the true aspect of discipline, and of his duty, and make up his mind—aye, and keep to it—to do his duty from proper motives, and he will find that the military code has no terrors for him.

And let me say a word here to you officers as to the enforcing of discipline. Military command is a very strong weapon, and needs to be wielded with discretion. An arbitrary order given in an arbitrary manner to a man who is more than half a civilian may do a great deal of harm. It is all very well to say that the man is under military law, and is therefore bound to obey. So he is, but human nature is weak, and men are often hasty. You must be careful, therefore, not to saddle a man with a military crime on insufficient grounds. Discipline and prompt obedience we must have, but they are of slow growth. Above all things, before attempting to enforce obedience, we must ourselves first learn to obey. If we ask ourselves before giving an order: (1) Is this lawful? (2) Is it needful? (3) Is it expedient in the circumstances?—we shall have a good guide to go by. There is not time at the moment to go through these mental processes, but if we cultivate this habit of thought we shall, in time, get a true view of military discipline, and not run the risk of damaging a man's character and driving him to commit himself in a military sense. So shall we reach a true state of discipline founded on mutual respect.

Again, a soldier has no monetary standard to go by; he serves without gain. When holding on to a position, he does not wait to see whether it is worth doing or not. He simply does his duty. In perfection it is a simple, childlike, and beautiful profession.

Above all, cultivate imagination. The profession of arms is almost the only romantic profession left to us. We must be encouraged, therefore, to see the romantic side of our profession. Seen through the right spectacles, even the 9·5 achieves possibilities which people of ordinary views have no conception of. Even the simplest matter of military routine can be glorified in this manner, and our interest and that of our men stimulated. Romance is the true magician's wand which glorifies all it touches, and modern life tends to destroy it. Cultivate it. It will elevate us towards the gods when otherwise we must inevitably sink downwards. So shall we best serve ourselves, our country, and our God.

In instruction, also, we must try and create the desire to learn in our men; they are volunteers, and presumably keen, but the surest way to make men keen is to be keen oneself. Some men have not the power of imparting knowledge. It is a gift. To such I give the advice not to try. Rather get a friend and lecture him, and try and improve yourself in this difficult art. But do not run the risk of boring willing men. It does more harm than good.

We can strengthen our moral fibre in many ways. Every time we hesitate when crossing a road we are weakening it. Cultivate habits of decision in little things and they will not fail you in greater things. For remember, we in war have to make up our minds under very strenuous conditions of danger and noise. We see our men falling and must still fight on; we are strained to breaking point, and must keep outwardly cool. All our men are keenly watching us, and take their view of the situation from our demeanour. Cultivate strength of mind as you do strength of body. Train it, and it will not fail you in time of stress, but you must train it. Do not harbour grievances. We all take ourselves too seriously, and this tends to make grievances, real or imaginary, rankle. A clean cut will heal at first intention if we keep it clean and wholesome; but if we let dirt get in we may get blood poisoning and suffer a great deal. A healthy habit of body, too, will assist the wound to heal quickly. So with the mind. Do not let things rankle, but cultivate a healthy habit of mind, and then grievances will soon assume their true proportions.

Possibly, gentlemen, you may think that my advice may tend to make you colossal prigs, but I think that the strong common sense of our race will save us from that pitfall. We do not want to be always thinking of ourselves, and, with practice, good military habits become second nature, but they will not come without practice.

We cannot expect, with the small amount of training that is possible for Territorials, to get anything like the results that we obtain from the Regular soldier, and we must not be disappointed at our shortcomings. But we can keep our standard high and our hearts high, and strive and strive, for by so doing we are doing our best, and he who has done his best can do no more. But let us be sure that it is our best.

XVII.

THE TURKISH ARMY.

By MAJOR F. CUNLIFFE OWEN, R.A., General Staff.

THE present organization of the Turkish military forces is believed to be based upon proposals submitted by Field Marshal Baron v. der Goltz in his capacity as Military Adviser to the Ottoman Government.

The Marshal had been previously employed by the Turks for a period of 13 years, *i.e.*, from 1882 to 1895, and had introduced in 1886 the scheme of organization which held good until the present year, while Prussian officers—including the renowned von Moltke himself—were serving in a military capacity with the Turkish forces so long ago as 1835. But although much benefit was undoubtedly derived from time to time from German assistance, it has been only during the last few years, *i.e.*, since the deposition of Abdul Hamid and the inauguration of the present Constitutional régime,¹ that sufficient funds and opportunity appear to have been forthcoming for the prosecution of extensive reforms and the maintenance of the Ottoman forces upon any really modern lines.

The present staff of German officers were engaged in the autumn of 1909, soon after the inauguration of the Constitutional régime alluded to, and they still continue serving to the number of 26, but Marshal v. der Goltz Pasha, although he still holds the *ex-officio* position of Vice-president on the Military Council, has not been in Turkey since the conclusion of the Grand Manœuvres in November, 1910.

Concurrently with the consideration of the re-organization scheme, which will be dealt with in detail later, a comprehensive new Law of Military Service was presented to the Chamber by Mahmoud Shevket Pasha, who, it will be remembered, was appointed to the post of

¹ The Constitutional régime was forced upon the then Sultan, Abdul Hamid, in July, 1908, by the "Young Turk" movement. In the following April an attempt was made by the Constantinople garrison, at the instigation, so it was said, of the Sultan, to overturn the existing Parliamentary Government. The revolutionists in the capital were, however, defeated by troops called in from outside, and Abdul Hamid was deposed, being succeeded by his brother Murad, as a strictly Constitutional monarch, in so far as temporal power is concerned.

Minister of War soon after he arrived in Constantinople at the head of the Salonica troops, on the occasion of the counter-revolution of April, 1909.

This new Law of Military Service has not yet been passed by the Chamber in all of its provisions, but many of the clauses are now in operation, notably that clause which extends the liability to military service to *all* Ottoman subjects, and thereby for the first time in history compels the Christian nationalities to serve as soldiers of the Sultan.² It may be noted that apart from the Christians, the new law is calculated to draw in also many classes of Moslems who were formerly exempt; thus, in previous times, the conscription did not apply to the city of Constantinople, nor in great measure to Albania, nor to Tripoli in Africa, or Turkish Arabia.

The new enactment has not been received with acclamation in all of these districts, in fact, it is stated to have been one of the reasons for the risings in Albania and the Hauran, and certainly no recruits have yet been taken from many purely Arab districts.

As regards the Christian nationalities, the application of the law, which had been welcomed in principle by the Christians as well as by the Young Turks, was the occasion of much controversy and some recrimination, the various heads of the non-Moslem communities demanding assurances that there should be no attempts at conversion during the period of colour service, and formulating other conditions which showed the innate distrust of the Turks in the minds of their Christian fellow-subjects.

The Œcumenical Patriarch, on behalf of the Greeks, demanded the formation of separate companies for the Christian soldiers, and that they should not be obliged to occupy the same barrack-rooms as their Moslem comrades. These and similar demands were considered by the military authorities to be absolutely inadmissible. Another contention was the admission of Christians to the military schools on the same footing as Turks, with a view to becoming officers. This is, in principle, conceded, but no steps have been taken towards carrying it into effect.

That the intention of the Government was to give the experiment a fair trial, and to treat the Christian soldiers well, may be inferred from the fact that, when they were first enrolled, stringent orders were issued to officers, and special precautions were taken, to ensure a good reception by the Moslem soldiers. There has undoubtedly been a tendency to confine them to the more menial duties of orderlies, cooks, officers' servants, &c., but, on the whole, it may be said that the Christians distributed in the army for training during the year have not, on the whole, had much cause for complaint.

² The famous Janissaries of Turkish history were formed from enslaved Christian children, but they were educated and brought up as Muhammadans.

However, it may be doubted whether the experiment has proved a success; later reports tend to show that the dislike of the Turks to the service of Christians on an equality with themselves is too strong to be easily overcome, and that the officers have ceased to interest themselves to the same extent as at first in the welfare of the new Christian recruits. But the opposition does not come from the Moslem side alone, and the Christians, now that it has come to the point, show themselves, on the whole, unwilling to enlist, and try every species of evasion, emigration, especially from the Greek islands and coast towns, with the object of avoiding conscription, being on quite a considerable scale.

In introducing the Military Estimates for 1910, the War Minister expressed the opinion that the Turkish Army should take rank as the fifth in Europe, *i.e.*, after the armies of Germany, Russia, France, and Austria-Hungary. In making this statement he, however, pointed out that it carried with it no committal to any offensive policy, but merely showed that the Government was desirous of having an army strong enough for the protection of the nation's rights and interests. This was proved by the fact that while all the other Balkan States contemplated an army on a war footing of 10 per cent. or more of their total population, Turkey had no idea of aiming at the 3,000,000 of men which a corresponding percentage, at a liberal estimate, would give in her case. On the contrary, a war strength of about half this figure was the limit which was desired.

The necessary peace strength of the army was stated to be 274,000 men, which, with a three years' term of service, means an annual recruit contingent of over 95,000. This number has not as yet been reached. The present peace effectives are about 230,000, the difference being no doubt due to motives of economy, for even with this peace effective the military and naval expenditure has mounted up to 33 per cent. or more of the total budget.

The present peace figures, built up by contingents of about 70,000 men, produce for war about 600,000 active army (Nizam); 400,000 reserve army (1st Class Redif, fully trained men); 120,000 reserve army (2nd Class Redif, partially trained, excess of recruit contingent for active army); and some 80,000 territorial troops (Mustafiz, *land-sturm*); making an estimated total of 1,200,000.

Whether or not the army contingent is augmented to the larger figures now contemplated, sufficient men are easily forthcoming to increase the war strength to 1,500,000 or more, the difference being that the balance will be partially trained (2nd Class Redif) if sufficient money is not available for their incorporation and training with the colours.

In dealing with the categories of troops just enumerated, it must be recollected that the 1st Class Redif must in no way be classed as second line troops. It is true that they are men who have finished

their ordinary Nizam service,³ but they are of equal, if not of superior fighting value to the Nizam, they can be mobilized almost if not altogether as quickly, and permanent cadres (especially strong in officers) exist for all units in peace. The 1st Class Redif troops formed a great part of the field armies in the 1877-78 campaign and in the Greek war of 1897, and they are constantly utilized to take part in Turkey's various "internal" wars or operations; in fact, to quote the words of Marshal v. der Goltz, they may be considered as the "kernel" of Turkey's military strength.

The 2nd Class Redif are men who have not passed through the colours, and who have received but a brief period of training. They also, however, possess cadres organized in peace time.

The Mustafiz correspond to the Landsturm of ordinary continental countries.

To turn now to the actual scheme of re-organization itself which was finally introduced at the beginning of 1911, the principal points on which this scheme was based appear to be :

- (a) A re-grouping of the regular army, by which the proportion of troops in Europe is increased and that in Asia diminished.
- (b) A better distribution of the reserve army units by which the number of units is regulated according to the actual capacity of the district.
- (c) A general organization by groups of three, the normal army corps having 3 divisions, the division 3 regiments, and the regiment 3 battalions.⁴
- (d) The formation of small self-contained divisions, composed of all three arms, and the adoption of the army corps as a higher fighting unit.
- (e) The adoption of a system of cadre battalions to allow for rapid expansion in time of war without a great additional expense in peace.

The general grouping of the army under this organization is as follows (Table A) :—

[See next page.]

³ Three years with the colours of the Nizam and six in the ordinary reserve (Ihtiyat) of the Nizam.

⁴ The intermediate organization of a "brigade" is abolished.

TABLE A.

EUROPE.	Divisions.	Cavalry Brigades.	ASIA.	Divisions.	Cavalry Brigades.	AFRICA.	Divisions.	Cavalry Brigades.
NIZAM.								
7 Army Corps comprising ...	20	8	7 Army Corps comprising ...	17	6½	1 independent division	1	½
3 independent divisions	3	...	2 independent divisions	2	...			
1st CLASS REDIF.								
6 divisions	6	...	33 divisions	33	...			
Totals ...	29	8	...	52	6½	...	1	½
Total 1st line troops :—82 divisions and 15 cavalry brigades.								
2ND CLASS REDIF.								
17 divisions	17	...	2 divisions	2	...	—	—	—
Total 2nd line troops :—19 divisions.								

For purposes of *administration*, the Empire is divided into four Nizam Inspection Areas and five Redif Inspection Areas.

NIZAM INSPECTIONS.

No. of Inspection.	Area.	Army Corps in Area.	Remarks.
I.	Constantinople, Thrace.	I. to IV.	These corps also recruit from Anatolia and Asia Minor, but no Nizam troops are stationed there, except one division at Smyrna.
II.	Macedonia, Albania, Epirus, Syria.	V. to VIII. also Independent Divisions 22 to 24.	Recruits are also taken from S. Anatolia, but no Nizam troops are stationed there.
III.	Kurdistan.	IX. to XI.	...
IV.	Mesopotamia.	XII., XIII.	...
Not comprised in Inspection Areas.		XIV. (Yemen) Independent Divisions 41 (Assyr), 42 (Tripoli in Africa), 43 (Hejaz).	...

REDIF INSPECTIONS.

No. of Inspection.	Area.	No. of Divisions in Area.	
		1st Class.	2nd Class.
I.	Same as Nizam, including N. and Central Anatolia and Asia Minor.	11	6
II.	Same as Nizam, including S. Anatolia, but excluding Syria.	9	13
III. } IV. } V. }	Same as Nizam. Syria.	8 4 7	

It will be seen from Table A above, that a Nizam Army Corps comprises 3 divisions in Europe, but only 2 as a general rule in Asia, while the Redif troops are organized entirely by divisions. It is anticipated that the fighting organization would eventually be 1 Nizam and 1 Redif division per Army Corps, which, when the present scheme is in final working order, would mean 38 such⁵ corps and 20 Redif divisions over for line of communication work.

⁵ This is omitting the divisions in Arabia, and in Tripoli in Africa. Four years is given as the time required for perfecting the present organization.

The Turkish Nizam infantry division is a comparatively small unit, consisting of but 10 battalions (as a rule 3 of these in cadre only in peace time), or 7,000 to 8,000 rifles. In addition, all the European corps and two of those in Asia have 2 rifle (Nishanji) battalions per corps = 1,500 rifles.⁶

The Redif division comprises 7 to 12 battalions, normally nine, but the strength per battalion may be taken at rather more than those of the Nizam.

The Cavalry brigades of 2 or 3 regiments form part of the corps troops, the first and fourth corps having two brigades each, and the remainder one each except the II and XIV (Yemen) corps, which have only single regiments.

Divisional Mounted Infantry companies are to be eventually formed.

As regards Artillery, an ambitious programme anticipates 9 four-gun batteries of field artillery per Nizam division, 2 four-gun batteries of horse artillery per cavalry brigade, 3 six-gun howitzer batteries, and 6 four-gun mountain batteries per corps. The necessary guns, however, are not at the moment in the country, so that only a few divisions have as many as 36 field guns, and nearly all the Asiatic units have only old pattern weapons; the majority of the corps have from 12 to 24 mountain guns (Q.F. in Europe), and some have howitzers.

A fairly large number of infantry regiments have been supplied with machine-gun detachments of 4 guns each, and some cavalry brigades with detachments of 12 guns.

As will have been gathered, there are no Redif cavalry or artillery.

The necessary engineer and medical services are now being supplied in the proper proportions.

SUMMARY OF NORMAL ORGANIZATIONS.

Infantry.—

Regiment of 3 battalions (in most cases 1 battalion in cadre in peace) and 1 machine-gun detachment of 4 guns.

No brigade organization.

Division of 3 regiments and 1 rifle (Nishanji) battalion.

Cavalry.—

Regiment of 5 squadrons.

Brigade of 2 or 3 regiments and 1 machine-gun detachment of 12 guns.

No cavalry divisions.

Artillery.—

(a) Field. Regiment of 3 battalions of 3 four-gun batteries.

Divisional artillery, 6 to 9 batteries.

No corps field artillery.

⁶ There are no regular fixed establishments in Turkey; battalions in recent operations have varied considerably in numbers, but 700 to 800 may be taken as an average strength.

- (b) Horse. Battalion of 2 four-gun batteries.
One battalion per cavalry brigade.
- (c) Howitzer. Regiment of 2 battalions of 3 six-gun batteries.
One battalion as corps artillery.
- (d) Mountain. Battalion of 3 four-gun batteries.
Two battalions as corps artillery.

Infantry division.—

- 1 rifle battalion.
- 3 regiments of 3 battalions.
- 6 to 9 field gun batteries.
- 1 company mounted infantry (to be formed).
- 1 bridging detachment.
- 1 sanitary detachment.

Army corps.—

- 3 or 2 infantry divisions.
- 1 cavalry brigade.
- 3 howitzer batteries.
- 6 mountain batteries.
- 1 battalion engineers.
- 1 telegraph company.
- 1 battalion train.

The following Table B shows the actual distribution of units by corps, divisions, regiments, battalions, and batteries :—

[See next page.]

TABLE B.

Corps.	No. of Infantry Divisions.	No. of Cavalry Brigades.	No. of Regiments.		No. of Infantry Battalions.	No. of Batteries.			No. of Guns.	Remarks.	
			Infantry.	Cavalry.		Horse.	Field.	Mountain.			Howitzer.
I.—INSPECTION AREA (Constantinople, Thrace, N. and Central Anatolia and Asia Minor).											
<i>Nizam Troops.</i>											
I. Constantinople	...	3	2	10	5	33	2	27	3	3	146
II. Rodosto	...	3	...	10	...	23	...	18	3	...	84
III. Kirk Kilisse	...	3	1	10	3	26	...	21	6	3	126
IV. Adrianople	...	3	2	10	5	29	2	18	3	3	110
<i>1st Class Redif.</i>											
Constantinople	...	2	...	6	...	18	...	...	...	...	...
Asia Minor	9	...	...	28	...	86	...	...	...	...	...
Anatolia											
<i>2nd Class Redif.</i>											
Thrace	...	4	...	6	...	16	...	...	...	...	...
Asia Minor	...	2	...	13	...	40	...	...	...	...	...
Totals	...	29	5	93	13	271 ¹	4	84	15	9	466
										¹ Excluding 21 cadre bat- talions.	

II.—INSPECTION AREA (Macedonia, Epirus, Albania, Southern Asia Minor and Syria).

Nizam Troops.

V. Salonica	...	3	1	10	3	26	...	21	6	3 ²	126	² To be formed.
VI. Monastir	...	3	1	10	3	26	2	21	6	3	134	
VII. Uskub	...	3	1	10	3	32	...	21	3	3	96	
Independent Divisions	{ Kozani Yanina Sutari }	3	...	9	...	30	...	15	...	...	60	
VIII. Damascus	...	3	1	10	4	23	...	12 ³	6	...	72	³ 6 to be formed.

1st Class Redif (including V. Redif Inspection).

Macedonia	...	2	...	9	...	31	...	...	...	...	...	
Albania	...	1	...	3	...	9	...	...	...	...	...	
Asia Minor and Anatolia	...	5	...	15	...	45	...	...	...	...	...	
Syria	...	7	...	22	...	65	...	...	...	...	...	

2nd Class Redif.

Macedonia	...	7	...	21	...	62	...	...	...	...	...	
Albania	...	5	...	16	...	46	...	...	...	...	...	
Epirus	...	1	...	3	...	9	...	...	...	...	...	
Totals	...	43	4	138	13	404 ⁴	2	84	21	6	488	⁴ Excluding 25 cadre battalions

TABLE B—continued.

Corps.	No. of Infantry Divisions.	No. of Cavalry Brigades.	No. of Regiments.		No. of Infantry Battalions.	No. of Batteries.			No. of Guns.	Remarks.	
			Infantry.	Cavalry.		Horse.	Field.	Mountain.			Howitzer.
III.—INSPECTION AREA (Kurdistan).											
<i>Nizam Troops.</i>											
IX. Erzerum	2	1	7	2	16	2	12	...	...	84	} ⁵ Yet to be formed.
X. Erzingan	3	1	9	2	21	...	18	...	3 ⁵	108	
XI. Van	2	1	6	2	14	2	12 ⁵	6	...	48	
<i>1st Class Redif.</i>											
Black Sea Coast, and South Eastern Kurdistan	4	...	12	...	36	...	...	...	...	...	} ⁶ excluding 22 cadre bat- talions.
	4	...	12	...	32	...	...	...	...	...	
Totals ...	15	3	46	6	119 ⁶	4	30	6	...	240	

IV.—INSPECTION AREA (Mesopotamia).

Nizam Troops.

XII. Mosul...	2	1	6	3	14	...	3	6	...	46
XIII. Bagdad	2	1	6	3	14	...	3	6	...	54

Mobilization.—As a matter of fact the process of assembling the men by units is comparatively rapid and simple, and it is only when the question arises of moving them in large numbers to any specified and perhaps distant spot, that the problem becomes complicated. The Ottoman dominions measure between their most distant limits over 2,000 miles, and possess but poor means of inter-communication, while there is little reliable information on the subject of moving large bodies of Turkish troops by rail or sea under modern war conditions.

As a rule, the mobilization to war strength of a Redif battalion is carried out more easily than that of a Nizam battalion, and in lieu of filling up the cadres of the Nizam battalions, it is very often simpler, in the case of the numerous internal operations which take place within the Empire, to summon complete Redif units.

The Nizam units are kept at very low peace establishments and are, in the case of many European corps, recruited from Asiatic localities; thus it takes time to assemble the necessary reservists ("Ihtiyat") and complete the unit, which itself is very often broken up in detachments. Added to this, in recent times the necessary numbers have been wanting owing to the fact that instead of obtaining a sufficient recruit contingent, reservists have been kept over time with the colours, and thus have formed an integral part of the peace battalions.⁷

In general a Redif battalion can be got ready to march from its headquarters on the seventh day after mobilization is ordered. The time for mobilization of a Nizam battalion must depend upon the locality in which it is quartered and the actual state of its peace strength.

In regard to the question of officers, the fact that the Redif cadres are supplied in peace with 15 officers per Redif battalion (the majority being regular officers) is a considerable advantage on mobilization. To mobilize her army completely, however, Turkey, as is the case with many other countries, has not sufficient officers to meet all demands, added to which the training and quality of the Turkish officer are still very variable quantities in many localities. The position in this respect is considerably better than in former years, and will continue to improve, while steps are now being taken to secure a supply of trained reserve officers. As matters stand at present, there would be a deficiency of about 6,000 officers if the whole of the 101 divisions of first and second line troops were fully mobilized.

Arrangements for the provision of the necessary transport are still most primitive, and though the needs of the Turkish soldiers are not so great as those of others, the want of an organized system of supply and transport appears to be a great defect in the military preparedness of the Empire.⁸

⁷ It has been the practice quite recently also to use 2nd Class Redifs to bring the Nizam battalions to war strength.

⁸ It is understood, however, that the question is now being seriously dealt with by a Committee, of which one of the German attached officers is a member.

A theoretical establishment for each unit exists on paper, and all vehicles and animals fit for transport duties are supposed to be registered in time of peace by a Commission at each Redif headquarters, this commission being responsible for the collection and issue on mobilization. During recent mobilizations for operations in Albania and other localities, however, it is understood that no transport of this nature accompanied the units, and in the last external wars, food and ammunition supplies were collected by officials and contractors at certain centres, and distributed to field depôts established along the line of communications by local labour. The arrangements went no further than this, every unit sending back as best it could to the nearest depôt for the necessary supplies, thus using its own men and whatever transport was available (generally pack animals), and reducing its fighting strength to perform non-combatant duties.

A certain small number of train troops belong to each corps in peace, and the light country carts and numerous pack animals existent in the country can be speedily taken up for military purposes; but the total absence of any such organization as ammunition columns must be a great handicap to a Turkish force acting against properly equipped regular troops, while although there is a plentiful supply of horses in the Asiatic provinces, the number of animals suitable for cavalry and artillery work is extremely limited, and has to be supplemented by purchase from abroad (S. Russia and Hungary).

*Training and efficiency of the Turkish troops.*⁹—Until comparatively recently nothing more serious was performed in the Turkish army in peace time than elementary and mechanical drills, barrack and guard duties, and stereotyped parades. To instance the lack of even ordinary training, such as is understood by the modern interpretation of the word, Marshal v. der Goltz relates that between the years 1883 and 1909 he only on one occasion witnessed a complete infantry battalion at drill.

Under the rule of Abdul Hamid the formal monotonous routine work was lifelessly performed by all, either in the barrack-room or at home. The higher ranks seldom saw their troops, scarcely knew them, and were themselves unknown to their men. He who exercised no influence over his inferiors, who adhered strictly to regulations, but who never bothered himself either about officers or men, was regarded as faithful and reliable, as a man without ambition, and therefore one who could be trusted.

Under these conditions all serious warlike preparations were impossible; in short, the army was to be nothing but a dumb and pliant tool, without individual initiative, in the hands of the Sultan.

Whatever, on the other hand, may be the shortcomings of the "Young Turks," they have at any rate paid attention to the needs

⁹ Certain of the criticisms here following have been taken from the published writings of Marshal v. der Goltz.

of the army, and, as mentioned previously in this article, have at last afforded those responsible for its training and efficiency the necessary funds and the opportunity to carry out reforms. The result is that in the last two years great progress has been made in the proper training, both of individuals and of units, so much so that, at any rate as far as the European troops are concerned, the opinion has been expressed that, given a further comparatively short period of uninterrupted in peace training, a large portion of the Turkish army would stand quite in the first rank.

Everyone who has had any official relations with the Turkish army fully appreciates the excellence of the material available. The Turk is willing, brave, contented, and enduring. He has a warlike spirit; one can make no more bitter reproach to a Turk than to tell him he is not a good soldier. His opinions cannot be altered by any agitation, nor by any outcry against militarism. On the contrary, such a proceeding only increases the lively desire of the whole people for military strength, so that they may command respect from the great Powers. Among the troops there is the force of great traditions, dating not merely from the days of conquest—the memory of which fills every Muhammadan breast with pride—but from more recent wars. The deeds of Plevna still live in their minds. An eye-witness of those events¹⁰ closes his remarks as follows:—"Finally, I am compelled to express my lively admiration of the soldierly qualities of the Turkish army. Undismayed in misfortune, uncomplaining under the most dreadful suffering, with good spirits at all times, both officers and men showed themselves throughout the whole campaign to be true heroes." The history of the siege of Sana in 1905, which is almost unknown to us, tells in brilliant fashion what the Turkish soldier can still do to-day. When after incredible sufferings Riza Pasha capitulated and the remnants of the brave garrison were allowed free passage by the Imam Yahia, a troop of about 1,000 emaciated figures appeared from the town to commence the march to the coast. The Arabs of the besieging force were astounded for, from the obstinate resistance, they had expected to see twenty times the number. All the others had perished, without a sign of indiscipline or of a desire on the part of the troops to surrender.

The Turkish troops evince great natural intelligence and a wonderful talent for improvisation. Good results, in spite of lack of means and insufficient preparations, are characteristics of the rank and file of the army.

On the other hand, among the officers the conditions are not so good as with the men. There is a lack of homogeneity and a want of a wide and uniformly educated stratum in the population, sufficient to provide the requisite numbers. Especially in the lower ranks of the

¹⁰ Doctor Ryan, "Under the Red Crescent."

officers there are a number of men who have been promoted from the ranks as a reward for past services, and are not of much value, side by side with the excellent products of the military schools, who are full of keenness. Only when the whole of the officers are recruited from the military educational establishments, can the army be raised to the level of modern instruction.

The interior regimental duties are very defectively performed. Among the Turkish Muhammadans there still exists a good deal of the old pride of conquest; they regard themselves as a superior race, and hold it to be beneath their dignity to bother about trivialities. They like to administer with a free hand, and the exchequer suffers in consequence from the heavy consumption of equipment and clothing. In the training of the troops also, while practice in command of the larger units is now studied, the importance of the careful elaboration of small details, which makes the correct leading of large bodies possible, is not appreciated. The work is regulated by the officer commanding the regiment, from tables carefully worked out from a cut and dried formula.

In order to gauge the actual progress made up to date in the Turkish Army as a fighting machine, one perhaps cannot do better than give a general summary of opinions expressed by various competent observers on the results of the 1910 manœuvres, which were the first on an extensive scale ever held in Turkey.

In general, the tactical principles current in the present-day German teaching were naturally followed, though in some cases their application was rather too accentuated. One must recollect, however, that the majority of the present commanders were young and inexperienced, and that such faults as were made were traceable to a good theoretical knowledge without sufficient practical experience for intelligent application.

The leaders showed plenty of dash and boldness in assuming the offensive, but it is probably in the selection and occupation of positions that the Turkish officer shows the most conspicuous talent. The ground is made the best of, the disposition of the troops and the placing of reserves are carried out correctly and appropriately, so that when once the position is occupied, little or nothing is usually to be seen from the direction of the enemy.

Lack of training appears in the actual movement and advance of individual units. Many battalions, and still more so regiments, have had but few opportunities for practising combined manœuvres, owing to their having been quartered in small garrisons. Deployments and extensions are generally slow, but when once deployed, either in attack or defence, the handling of the troops is quite excellent. In the matter of fire-support and the transition from movement to action, it is clear that a good start has been effected, and further progress may be confidently anticipated.

The endurance of Turkish troops on the march is very good, but the pace lacks freedom and regularity, and the rate is slow.

The services of reconnaissance, security, intercommunication, and intelligence are still defective. This may be partly ascribed to want of training in the cavalry which is the least efficient of the three arms, but the essential fault probably lies with the present composition of the whole body of junior officers, who as yet lack a strict sense of duty, independence of character, and full consciousness of responsibility.

When all is said and done, however, the manœuvres proved that Turkey, under the present Government, is already in a position to raise a very considerable body of well-equipped troops, and that a real start has been made in the matter of systematic training for the army. It was also demonstrated that, in the event of war, there would be no lack of leaders capable of commanding forces composed of all three arms. It would be unfair to apply to the Turkish army, in its present stage of development, the same standard of criticism as that applicable to other armies, accustomed to modern manœuvres on a large scale for the last 40 or 50 years. The Turkish officers and men were both new to this kind of work, and in the absence of practical experience had, for the most part, to rely almost entirely upon their own resources and theoretical knowledge alone.

On the other hand, it must be admitted that the course of the manœuvres, taken all together, was in accordance with active service conditions. The decisions taken by officers commanding were appropriate to the situations, their appreciation of ground was correct, and they made proper use of it, while the general bearing of the young troops must be highly commended.

The shortcomings noticed were due to inadequate training and lack of experience. Everything in the Turkish army is not yet up to the standard needed for success in war. This is realized in Turkey. The results of these manœuvres have not dazzled the military authorities, and they have not drawn the false deduction that they can now rest on their laurels or relax their efforts.

But the good results were attained with men, almost all of whom had only a short period of service behind them, and what a wonderful material it was, those men called up to the colours! In goodwill, unpretentiousness, temperance, simple habits, natural intelligence, and physical fitness, the Turks are unequalled.

One of the most satisfactory results achieved, as well as one of the most important, was the daily increasing interest taken in the manœuvres on a large scale, especially among the senior officers. The desire to lead, to command, grew among general officers, and fondness for their profession among their subordinates. For 30 long years a lethargy had smothered this soldierlike keenness, and had been a great enemy of progress. It led to a shallow pessimism, which in the end ceased even to desire any improvement. Now that is finished, and finished

it is hoped in Turkey, once for all. The example of the manœuvres has brought the possibility of great success clearly before everyone's eyes, and ambition and self-reliance have been once more aroused.

The result is not confined to the Army alone, but extends to the population at large, which now looks to the future with the hope of renewed prosperity for their country.

XVIII.

SOLDIERING ON SKIS.

By LIEUT. J. H. M. CORNWALL, F.R.G.S., Royal Field Artillery.

THE British soldier learns his trade under so many and diverse conditions of climate, country, and temperature, that a phase of warfare entirely strange to him seems scarcely credible. Last winter, however, as the guest of the hospitable Norwegian Government, I enjoyed the privilege and pleasure of taking part in manœuvres very different in their nature from those to which we are accustomed in this country.

Hitherto, our military experiences and requirements have been rather limited to the torrid zones of the globe, and our troops are, by virtue of their training and equipment, more prepared for a campaign in the tropics than for operations in the frozen wastes of the north. If our Empire is one on which the sun never sets, it is equally one on which the snow never melts, and the frozen snowfield is at least as favourable a theatre of operations as the sun-scorched desert or the swamp-sodden jungle.

Although we may not actually contemplate a campaign in the Pamir, the Caucasus, or the Rocky Mountains, we must expect to find, even in the "civilized country with a temperate climate" where our expeditionary force hopes to fight, a landscape lying for an appreciable portion of the year deep in snow; under such conditions the horse is indeed "a vain thing for safety," and the infantryman himself will flounder ineffectually when forced to quit the beaten track. European armies no longer go into winter quarters as they used to in pre-Napoleonic times; modern warfare does not admit of inaction, and delay usually spells defeat.

In a campaign carried out under the rigours of a northern winter, we may therefore safely assert that, with an equality of other conditions, superior mobility is the decisive factor. The problem of mobility in snow-covered country appears at first sight to present formidable difficulties, but is in reality not difficult of solution when tackled in a practical way. Before describing how the Norwegians have solved this problem, I must however inflict upon my readers a

brief *résumé* of the Norwegian system of military organization and training.

The Norwegian compulsory militia system is eminently suited to the spirit of the most democratic monarchy in Europe. With a very few exceptions every able-bodied Norwegian is *vernepliktig* (liable to serve) for 12 years in the line and 8 years in the *landvern*, or second line. The actual time spent under arms by the citizen-soldier consists of a period of recruit-training which varies from 7 to 14 weeks in the different arms of the service, followed by a course of 24 days embodied training in the first, second, third, and seventh years of military liability.

The officers, commissioned and non-commissioned, undergo a course of training at a military school varying from two to four years, so that they are ensured a thorough knowledge of their professional duties.

The Norwegian field army is organized in six composite brigades, roughly corresponding to our infantry divisions. Of these, only three, namely, the 1st (Fredrikshald), the 2nd (Christiania), and the 5th (Trondhjem) have their full proportion of the various arms, the remaining three brigades being specially organized for mountain fighting.

Each of the first five brigades has a cyclist company, which in winter exchanges its cycles for skis, and is then known as a *skiløper-kompani* (ski-runner company). As every Norwegian can run on skis from his childhood up, the men of these companies are selected rather for their proficiency as cyclists than as skiers, and, as far as possible, they carry out their four annual trainings alternately in winter and summer, so as to get two trainings on skis and two on cycles.

The officers of the skier-cyclist companies are mostly selected from the infantry brigades, but a few are also taken from the cavalry, as it is intended to use the *skiløper* companies in conjunction with mounted troops as well as with infantry.

The field service equipment of the ski-ing companies is practically identical with that of the infantry, except that the former are armed with a carbine instead of a rifle, and carry no bayonet. The equipment, all carried on the soldier, comprises the following: a strong pair of Telemark skis and two ski-sticks; 6.5 millimetre Krag-Jørgensen carbine; waterbottle; mess-tin or hatchet or entrenching tool; wind-jacket; triangular tent section and one peg; in addition, a *rucksack* and two ammunition pouches, containing 120 rounds of ammunition, a day's ration, a reserve ration, a change of under-clothing, an Iceland jersey, and a sleeping-sack. The total load, exclusive of skis, weighs between 20 and 30 kilogrammes.

The *rucksack*, though heavy, is an excellent method of carrying this pretty considerable load, and distributes the weight very evenly

by means of a *meis* or wooden frame like a saddle-tree, which is shaped to fit the back and prevents galls.

The *vindjakke* is a very useful article, and replaces the greatcoat on service. I very quickly discarded my "coat warm British" in its favour. It is a short jacket of closely-woven khaki canvas, quite light but waterproof; it resists the most piercing winds, and, an important point, the snow does not adhere to it.

The *skjærm-telte* or shelter-tent is also very serviceable and merits description. Each man carries, rolled up and strapped below his *rucksack*, a triangular piece of thin canvas, each side of which measures about 7 feet, and is provided with a row of hooks and eyes. In summer the men mess together in groups of four, and four of these canvas sections when joined up form a tent of pyramid shape. In winter, however, a much larger tent is constructed by hooking together 16 tent-sections; it resembles a large bell-tent, but, instead of being supported by a single centre-pole, it is stretched on a number of "*reier*" or pine poles, like the Lapp tent or the American wigwam. The poles are not carried by the troops, but are hewn from the nearest pine forest, which in Norway is never far off.

The tent is more roomy and comfortable when made conical instead of pyramidal; this is effected by using a greater number of *reier*, 8 or 12 being the usual number. At the top, where the poles are tied together with wire, the canvas is left unhooked so as to form a chimney. In the centre of the tent a collapsible iron-wire basket is slung by wires from the tent-poles at about a foot from the ground, making a very efficient fireplace. Before the *reier* are erected, the snow is scraped away and built round the outside to keep out the wind, while the inside is made snug and dry by means of a thick, springy layer of pine branches. I slept four nights in this kind of tent and suffered no discomfort, although the cold outside was intense, and we had both wind and snow.

Thus equipped, the Norwegian ski-soldier can face in safety, if not in actual comfort, the rigours of his Arctic winter. No mountain is so steep, no forest so dense, no snow so deep, as to bar his progress. The pace may at times, owing to the difficulties of the country, be snail-like, but like the snail he carries his house on his back. In a country where one's path in summer is constantly impeded by winding lakes and swollen torrents, the all-embracing cloak of ice and snow only renders the country more accessible to the hardy ski-runner.

Never shall I forget those route marches which I undertook while attached to the First *Skiløper* Company. Our way—road there was none, of course—lay through the beautiful pine forests and across the frozen lakes of the Nordmarken, that wild and picturesque region which forms the winter playground of the natives of Christiania.

Parading by the light of the sergeant-major's lantern, we would be well away before the dawn, plunging into the apparently primeval

forest, and threading in single file its precipitous paths. Climbing those slippery ridges is no joke if you are not an expert on skis, especially with a 50-lb. pack on your back to upset your balance at every unexpected turn. But there is no pause for rest at the top, and the descent is, for the novice, still more to be dreaded than the arduous upward climb.

One speeds down the hummocky forest "*lōipe*" with winged feet, dodging trees, rocks, and more rarely those of the company who have come to grief. The pace grows more furious, the track more bumpy, one tries in vain to "stem" with one's ski-sticks; a snow-covered pine log lies across the path—now for a *sprōite-hop*! One's skis leave the snow and one flies 15 or 20 feet clear in the air; a bend of the knees and a jerk of the body; one recovers one's precarious balance and glides safely out on to the frozen surface of the lake, conscious of the good-natured smiles of encouragement which the Norseman accords to those who venture to "take him on" at his own game.

It is like that all the time when you go on the line of march with a *skiløper* company, and we did 100 miles of it in four days with all our transport on our backs. We slept in the *skjærm-telte* described above, or were billeted in some lonely *sæter*. The march was each day resumed at dawn so as to utilize to the full the short days of the northern winter.

But it must not be imagined that soldiering in the Norwegian snows is confined to training specialists in forced marching or guerilla warfare. After three weeks' strenuous training in wood-fighting, field-firing, reconnaissance, and long-distance running on skis, all the troops doing winter-training were assembled in the neighbourhood of the capital to carry out winter manœuvres. There I witnessed the spectacle of more than 1,000 men on skis performing the tactical evolutions of the fire-fight with the precision and dash of well-trained infantry.

Despite the unfavourable snow conditions which prevailed, these manœuvres afforded a revelation of the tactical significance of the ski-runner. It is safe to say that, at present, no other army in the world could compete with the ski-mounted soldiers of Norway on their native snows.

To give my readers an idea of the tactical employment of troops on skis, I shall enunciate briefly the principles laid down in the newly-published "Regulations for Skiløper Detachments."

"The rate of marching depends greatly on the state of the snow; every ski-runner has experienced the discomforts of a bad, sticky *jore*. On good snow, and in fairly flat country, the average pace is 6 to 7 kilometres per hour.

"As *skiløper* detachments are often the only troops capable of moving off the roads, they will be principally employed in protective

duties. Especially will the service of reconnaissance, otherwise incumbent on cavalry and cyclists, devolve in winter on skier troops. The best skiers must be chosen for reconnoitring patrols, the detachments usually acting independently, only rarely in conjunction with cavalry.

“When cavalry and skiers are sent forward together to reconnoitre, they must supplement each other mutually, the skiers being employed across country and wherever the snow is deepest. When it is important to advance rapidly, mounted men may occasionally be employed in towing skiers (*snorkjöring*).

“Skiers are especially useful with an advanced guard on the march ; it is desirable that the vanguard, and, if possible, a portion of the main guard also, should be mounted on skis.

“During a retirement, ski detachments will be employed with the rearguard in a similar way as with the advanced guard to a force advancing. As they can get across country easily, they will often be able to hold successfully positions flanking the enemy’s line of advance, to cover the withdrawal of their own troops. They are specially suited to undertake a delaying action, especially when the enemy has no troops on skis, and his infantry consequently flounder in the deep snow whenever they quit the roads. A ski detachment may be used to cover the rearguard artillery, when it is being kept in action as long as possible against a pursuing enemy.

“Outpost duty will be difficult to carry out satisfactorily in winter without the help of ski detachments, whose employment effects great economy in numbers and exertion on the part of the troops. All piquets, and as far as possible the supports as well, should be skiers. At all events, the outpost companies must have a proportion of skiers at their disposal for the maintenance of communication.

“By reason of their great mobility, ski detachments will play such an important rôle in the fire-fight that every commander must endeavour to mount as many of his men as possible on skis. When this can only be managed for a portion of the force, the skiers must be employed where their mobility can best be turned to account. They will be of most service where it is important that the advance should be rapid and continuous, where the line of advance is long, and where it does not follow beaten tracks.

“In the initial stages of an engagement, skiers are employed in reconnoitring the enemy’s strength and dispositions, especially on the flanks ; in protecting the infantry deployment, and in making good and holding important points until the infantry can advance. During the further development of the fight, skiers are employed mainly on the flanks, as a rule on the offensive.

“In the attack, ski detachments are used in executing enveloping movements, in defence, for protecting the flanks and in delivering the counter-attack. When not employed on the flanks they can be

used as a mobile reserve for the rapid reinforcement of the firing line wherever necessary. After the battle, ski detachments will either take up the pursuit or cover the retreat."

It will be seen from these extracts that ski detachments are employed almost exactly as we should use mounted infantry, with the great advantage that neither horseholders nor forage are required. A hostile army in Norway during the winter months would encounter worse difficulties than we met with in South Africa in 1899. Ski-ing, besides being a fine sport, is an important military accomplishment, and it would surely be an advantage to our army, which must be prepared to fight in so many quarters of the globe, if the numerous British officers who visit Norway or Switzerland each winter were encouraged to practise reconnaissance work on skis. I have attempted this not only in Norway, but also in the Black Forest and the Vosges, and no pastime could be more healthy and fascinating, and at the same time more instructive. I am sure that our Norwegian friends would be only too willing to help us with instruction and advice.

Even though we cannot train large bodies of troops to fight on skis, the ability to send out officers' patrols of confident and strong ski-runners might, under certain quite possible circumstances, prove invaluable. Norway, Sweden, Russia, France, Austria, Germany, Italy, and Switzerland have all recognized the military importance of ski-ing by encouraging it in their armies. The Austrians have just added a ski-patrol to the establishment of their field artillery brigades; the German Army holds ski-ing courses every winter for officers and men in the Black Forest; the "*chasseurs alpins*" are becoming very proficient at their school of ski-ing at Briançon; surely the British Empire, which has as much snow-covered territory at its disposal as any of these countries, should now also enter the lists. Derbyshire and Cumberland, not to mention Scotland and Wales, often afford as good ski-ing facilities as the Alps or the Jotunheim, and there is no reason why the soldiers of our Empire in Canada and on the Northern Frontiers of India should not become as serviceable ski-runners as our expert cousins across the North Sea.

XIX.

THE CHINESE ARMY.

By CAPTAIN N. P. BROOKE, Leinster Regiment, General Staff.

THE growth of the Chinese modern army has been one of the most remarkable features of the reform movement in China. The profession of arms had from time immemorial been despised ; so much so that proverbs were current which testify to the contempt that the average Chinese had for the soldier. The army was recognized as a necessary evil, and only men from the very lowest grades of society were willing to serve, whether as officers or men. It is little wonder that under these conditions every quality that goes to make a soldier became atrophied. The Chinese army consisted of a rabble of coolies who, when they did not receive their pay, preyed on the country round, and fully justified the evil reputation which soldiers had always enjoyed.

Owing to the undeveloped state of communications at the time of the Sino-Japanese War in 1895, the disasters which befell the Chinese arms made little impression on the country at large, but a few responsible officials began to realize that the time had come when China must begin to put her military house in order. Chang Chih-tung, one of the most patriotic and single-minded of Chinese officials, then Viceroy at Nanking, was the first to recognize this necessity. He engaged German officers and non-commissioned officers to train the troops at Nanking, and, at the same time, created a military school and improved the arsenal. On being transferred to the Viceroyalty of Hunan and Hupei, he established another military school in Wu-chang, built the Hanyang arsenal, and formed a fresh body of foreign drilled troops. Meanwhile, active steps had also been taken towards raising an army in the north. Five so-called divisions, each of about 10,000 men, were raised for the especial defence of the throne. Four of these divisions took an active part in the Boxer rising of 1900. The 5th Division, stationed in Shan-tung under Yuan Shih-k'ai, who was then Governor of that province, remained neutral. In 1901, Yuan was appointed Viceroy of Chih-li. His division accompanied him to his new post, and became the nucleus of the modern army.

The beginning of the twentieth century found the Court at last fully alive to the necessity of having a large and efficient army. As soon as the foreign contingents had commenced to withdraw from North China in 1901, an edict was issued ordering viceroys and governors to train their troops on modern lines, and to arm them with modern weapons.

Hitherto, the *Ping Pu* or Board of War had controlled or attempted to control the military affairs of the Empire. It was composed of a body of civil mandarins, wholly unqualified to perform this duty, and it soon became apparent that so long as a board of this nature was charged with the control of the army, no satisfactory results could be expected, and so in 1903 a new department was created, and called the *Lien-ping Ch'u*, or Army Training Department. This Department was made responsible for the issue of regulations for the training of the regular army, or *Lu Chün* as it was now called, and for their observance throughout the Empire, and also for the administration of five divisions. In this way it was hoped that uniformity in arms, equipment, drill, and uniform would be secured. The remaining divisions, however, remained under the administrative control of the viceroys and governors of the provinces in which they were raised. The Board of War still continued to exist, and exercised a general control over the Provincial Troops (a permanently embodied force distinct from the regular troops) of every province.

This system continued for three years, until early in 1907 the *Lu-chün Pu* or War Office was created, and both the Board of War and the Army Training Department became extinct. Although changes of greater or less importance have marked almost every month since this date, still the general principles of administration have remained as at first formulated. By these, the War Office exercises direct control over the metropolitan divisions and over certain divisions lent to provinces, which, through lack of funds, have been unable to raise divisions of their own. The viceroys and governors, however, control and pay for the divisions raised in their provinces and supported out of provincial funds, but are subject to a general control by the War Office so far as regulations as to training, clothing, pay, appointment of officers above the rank of field officer, and of staff officers are concerned.

During the years in which a modern army had been in existence, events had moved rapidly in China, but deep-seated prejudices had remained unchanged. It was recognized that something must be done to raise the prestige of the army, and in 1909 two important edicts were issued; one appointed the Emperor Commander-in-Chief of the Land and Sea Forces; a second authorized a table of precedence, by which a lieutenant-general was made to rank with a viceroy, a major-general with a governor, and so on down the military and civil hierarchy to a second-lieutenant ranking with a district magistrate. The result of

this edict was at once apparent. The army became a popular profession, princes of the blood were given high appointments, and young Manchus and Chinese of high birth became anxious to serve. Simultaneously with the edict appointing the Emperor Commander-in-Chief, a change was made in the General Staff. This had hitherto been a department of the War Office, and its duties had always been kept a profound secret, possibly because it had none. In this year, in imitation of the Japanese system, the General Staff was established as an independent body, to be "an advisory board to the Emperor on military and naval affairs."

Further changes were made in 1910. Since the Sino-Japanese War, the Chinese navy, except for four cruisers and a few torpedo and gunboats, had been non-existent, and naval matters were controlled by a Naval Section in the War Office. After the return in 1910 of the naval commissioners from their world tour, an attempt was made at a reorganization of the navy. Orders for ships were placed with various foreign firms, the Naval Section at the War Office was abolished, and an Admiralty was established enjoying equal status with the War Office. At the same time the War Office itself was once more entirely reconstituted. A host of officials with ill-defined duties were dismissed, and a War Minister, assisted by a Vice-Minister for War, became the recognized responsible head of the army.

ADMINISTRATION.

The dual system of administration of the Chinese army, to which allusion has been already made, is recognized as a source of weakness, and the efforts of the War Office have been continually directed towards securing administrative control over all the *Lu Chün* of the provinces. It was only in 1910 that the 2nd and 4th Divisions, quartered in Chih-li province, passed from the control of the Viceroy of Chih-li to that of the War Office, which now directly administers the Guards, 1st, 2nd, 4th, and 6th Divisions, quartered in Chih-li, and the 3rd, 5th, and 7th Divisions, "lent" to the Manchurian Shan-tung and Chiang-su provinces respectively. The remaining divisions and mixed brigades are administered by the viceroys and governors of the various provinces, acting under the advice of Local War Boards established in the provincial capitals.

ORGANIZATION.

The largest unit of peace organization in the army is the division consisting of two infantry brigades and divisional troops. An edict of 1908 laid down that 36 divisions were to be raised by 1912, but it was, from the first, evident that, owing to financial difficulties, there was little prospect of this establishment being reached within the time limit laid down. Each province was to raise one or more divisions

according to its resources and population. A division of the Guard, to be raised in Chih-li and to be recruited almost entirely from the Manchu population, was subsequently added to this establishment.

At the outbreak of the present revolution, the regular army consisted of a Guards Division, 11 line divisions, four of which were incomplete, and 20 mixed brigades, which were being raised by slow degrees to the strength of divisions. The actual combatant strength amounted to some 190,000 of all ranks with 1,006 guns.

A division consists of—

- two infantry brigades (each of two regiments of three battalions),
- a regiment of cavalry (three squadrons),
- a regiment of artillery (three battalions each of three batteries of six guns),
- a battalion of engineers (four companies),
- a battalion of transport (four companies),

with a fighting strength of 10,461 of all ranks, and 54 guns, usually 36 mountain and 18 field guns, though this proportion does not always hold good. It is intended that each division shall also include a machine gun detachment of 24 guns, but at present only two divisions, the Guards and the 19th, have their full complement. A bearer company, military police, and band also exist in many divisions and mixed brigades, but their organization is as yet incomplete.

In war, the strength of a division would be increased by the addition of 5,170 men from the reserves, while the mobilization regulations contemplate the formation of army corps, each consisting of a regular division with its reservists, a reserve division (8 battalions of infantry), and a reserve brigade (4 battalions of infantry). At present, however, the reserves available only number some 20,000.

RECRUITING AND CONDITIONS OF SERVICE.

Recruiting is on a territorial basis, that is to say, a soldier enlists for service in the *Lu Chün* of his own province. Formerly, a limited number of men were allowed to enlist for service in the *Lu Chün* of provinces other than their own, but this practice has now been discontinued. A modified form of conscription exists. A district magistrate receives an order to enlist recruits up to a certain number, fixed according to the population of his district. If the number of recruits demanded is not forthcoming, resort is doubtless had to compulsion, but, as a rule, little difficulty is experienced in most provinces in producing as many men as are required. In accordance with the idea of raising the status of the soldier, efforts are now being directed towards securing a better class of recruit. A man, in addition to fulfilling the usual requirements as to age and physique, must also produce a guarantor as to his good character, and evidence that he is not an opium smoker. On enlistment, he serves for three years with the standing army (*ch'ang-pei chün*), except in the case of a recruit

for the Guards, who only serves for two years. During this period he receives 11s. 7d. a month as a second class soldier, and 12s. 5d. a month as a first class soldier. He is then transferred to the first reserve (*hsü-pei chün*), in which he also serves for three years. As a first reservist he receives 2s. 9d. a month, except during his period of training. This takes place annually, and lasts for four weeks; he then receives the full pay of a soldier serving with the colours. The first reserve are organized in battalions and are all trained as infantry, since other arms on a war footing receive no increase in personnel. On completion of his service as a first reservist, a soldier, if he wishes, passes to the second reserve (*hou-pei chün*). He serves for four years, receiving 1s. 5d. a month, and does one month's training on full pay during the second and fourth year. At the present time, second reservists exist only in the provinces of Chih-li and Shan-tung.

The proportion of Manchus serving in the regular army is small. The rank and file of the 1st Division and a mixed brigade, quartered at Jehol near Peking, are exclusively Manchu; the officers, however, are for the most part Chinese. The Guards Division contains one Chinese regiment of infantry, and a Mongol squadron of cavalry; the remaining units are all Manchu. Manchus are occasionally met with in other divisions, but never in any numbers, and the remainder of the army may be considered to be entirely Chinese. The Manchu troops that were responsible for the deplorable massacre of non-combatant Chinese at Nanking on the 8th November, 1911, were not regulars. They formed one of the garrisons which were established in many important cities all over the Empire on the accession of the present dynasty in the 17th century. They are for the most part only half-trained and of little military value. In physique, the Chinese compare very favourably with the Manchus. All male Manchus are nominally soldiers, and as such receive a monthly allowance of money and rice. This hereditary grant is just sufficient to enable them to live in idleness, with the result that the physique of the race has deteriorated, and they are now no match for the more virile Chinese. One tangible result of the revolution, however, will probably be that this dole, always so obnoxious to the Chinese, will be discontinued.

ARMAMENT.

The most serious defect in the army is the diversity of armament now in use, which will greatly complicate the question of ammunition supply in the field. The authorities, realizing this, have fixed upon a standard bore, 6·8 mm. (.267 in.), to be adopted for all rifles, and the arsenals in Shanghai, Han-yang and Canton are now engaged in re-boring Japanese rifles to the standard bore. The Mauser 1888 pattern and the Japanese 30th year Meiji rifle are most generally used, but other patterns are also found. In some cases even, there are two patterns of rifle in use in the same division. With the artillery

it is the same. Krupp field guns of 75 mm. (2.95 in.) and mountain guns of 57 mm. (2.24 in.) are likely to be the pattern ultimately adopted, and by far the larger proportion of the artillery regiments are armed with these patterns, but Japanese Arisaka model, Creusot, and Vickers-Maxim guns are also used, while only last year Skoda guns were purchased for a mixed brigade in Manchuria. The arsenals are now copying the Krupp gun, and one such made in the Kiangnan Arsenal at Shanghai was exhibited at the Nanking Exhibition of 1910.

EDUCATION.

The most promising feature of the army is the educational system, which is now beginning to turn out large numbers of well trained officers. A candidate for a commission has now to undergo a very severe course of education before he is considered fit to take his place in the *Lu Chün*. At the age of fifteen he enters the *Lu Chün hsiao hsüeh-t'ang* or Army Primary Cadet School (corresponding to the German *Kadettenanstalt*), one of which is now established in every provincial capital. He studies here for three years, and then passes to one of the four *Lu Chün chung hsüeh-t'ang*, or Army Middle Cadet Schools (equivalent to the German *Hauptkadettenanstalt*) at Wu-chang, Nanking, Hsi-an Fu (in Shensi), and Pao-ting Fu, for a two years' course, on completion of which he is attached to a unit of *Lu Chün* for six months. He then does a further two years' course at the *Chün-kuan hsüeh-t'ang* or Officers' School (corresponding to the German *Kriegsschule*), after which he receives his commission. It is evident that seven years' continuous instruction should produce a very highly trained type of officer; but the system suffers from lack of experienced instructors, and the desire to dispense with foreign assistance. German advisers were at one time employed, but the large number of Japanese trained officers who filled important posts caused Japanese influence to become paramount, and many Japanese were engaged as instructors in the schools. Their contracts, however, have been allowed to expire without being renewed, and now only seven remain. During the past year a reaction in favour of securing German assistance, due probably to the pro-German tendencies of the late War Minister, Yin Ch'ang, seems to have taken place, with the result that three German officers have been engaged to advise the War Office on educational matters, and to supervise instruction at the Officers' School.

A scheme for establishing a Staff College at Peking has been under discussion for some time. Meanwhile, a *Yü-pei ta hsüeh-t'ang*, or Preparatory Staff College, has been started at Pao-ting Fu, and contains now 120 students.

Courses of instruction are also formed in all garrisons for the education of the older officers, since large numbers of these still exist who have not had the advantage of a training in Japan.

Several schools of survey have been started, and much excellent work has been turned out. The Chinese show aptitude for this kind of work, and good plane-table surveys of portions of Shan-tung and Chih-li have been done.

TRAINING.

Japanese influence has left a very definite mark on the training and drill of the Chinese Army. Material for Chinese drill books is copied largely from the Japanese, while many of the military terms are taken from the same source. Grand manoeuvres have taken place three times since 1905, and though partaking on each occasion of the nature of a set piece, gave evidence of progress, both officers and men showing interest and keenness in their work. Minor divisional and brigade manoeuvres take place annually. Formations are too dense, according to our ideas, with the result that impossible situations are of frequent occurrence. Close order drill is admirable, and all movements are executed with great precision. An open-air gymnasium has its place in all barracks, and the men show great activity in this and all forms of physical exercise. Far too little attention is paid at present to musketry and artillery practice. Indeed, in some units, it is doubtful whether musketry practice ever takes place, while even in the best of the divisions it is only practised at rare intervals. The difficulty of finding funds may largely account for this serious defect, but time-honoured customs cannot change in a day, and doubtless in some cases money destined for the purchase of ammunition has been devoted to other less worthy objects.

Much time is given to indoor theoretical teaching of both officers and men. All barracks now have a lecture room, where instruction takes place daily, and many of these contain models of field fortifications and pictures of military operations of all sorts.

PROVINCIAL TROOPS.

In estimating the military strength of China, it is necessary to consider the Provincial Troops, a force organized by each province and under the control of the viceroy or governor. They are to a certain extent analogous to the military police maintained in some British possessions, and serve to maintain order in their districts and quell local disturbances. So long as the reserves to the regular army are inadequate, it is contemplated that in time of war they will form a second line of defence. Their numbers amount approximately to 214,000, but a large proportion of these would be rendered immobile by the necessity of maintaining order locally, and probably not more than about 80,000 could take the field as a mobile force. Even for this number no organized transport exists. The men, though not so well trained as the men of the *Lu Chün*, are of better physique, and, it is considered, would make better fighting material. In times of dis-

turbance or mutiny amongst the *Lu Chün*, the Provincial troops have generally been faithful to the government, probably owing to the fact that while enlistment for the *Lu Chün* is on a territorial basis, the Provincial Troops as a rule serve out of the province in which they have been recruited. Some ill feeling, moreover, has been aroused between the two forces by the fact that the *Lu Chün* receive more favourable treatment as regards pay and equipment.

The Provincial Troops are organized in battalions of infantry, 301 strong, and squadrons of cavalry, 181 strong. No organized artillery exists, except in the case of a force quartered near Peking. The efficiency of the Provincial Troops varies considerably in different localities. In Chih-li and on the Burma-Yün-nan frontier they are well-trained and serviceable, but in most other districts they are of little value, at present, from a military point of view, though they are drilled on modern lines, and perform their police duties fairly well. Their armament varies according to the financial prosperity of the province which is responsible for their upkeep. Rifles and muskets of almost every known pattern, ranging from the Tower musket to the 1888 Mauser, are in use, and in some battalions rifles of two or more patterns have been noticed.

Although the progress made by the army during the past few years has been remarkable, there still remains much to be done before it can be considered fit even to defend its own frontiers against a foreign Power. The influence of the schools is only just beginning to be felt, and the officers, although possessed of sufficient confidence in themselves, are as yet unable to command the confidence of the men. The unorganized condition of the transport and medical services, the diversity of armament, the almost complete neglect of musketry and artillery practice, and the inadequate communications throughout the Empire, all deprive the Chinese army of any claim to be considered as a serious menace to other Powers. Its strongest asset is its personnel. Cheerful, frugal, obedient, blessed with an almost entire absence of "nerves" such as we understand them, the Chinese soldier, under a leader whom he trusts, is fit in point of courage to take his place beside any European soldier. This has been proved during the Tai-ping rebellion, in the case of the Imperial troops, led first by Ward and afterwards by Gordon; and also during the Boxer rising, when the Chinese Regiment, trained and led by British officers, distinguished itself at Tientsin. The material is there. It is leadership for which the Chinese army now waits.

XX.

THE EDUCATION AND TRAINING OF THE GERMAN OFFICER.

By CAPTAIN W. L. O. TWISS, 9th Gurkha Rifles, General Staff.

A. PRELIMINARY.

B. HIGHER.

THE German corps of officers is drawn from a more or less exclusive social caste, mainly composed of the aristocracy, especially the poorer nobility ("Kleiner Adel"), and the sons of officers. Owing to other attractions, such as the navy and commerce, and owing to the constant augmentation of the German army and the necessity of small private means, it is becoming increasingly difficult to obtain an adequate supply of officers from the recognized sources. The result is that the recruiting area is being gradually extended, and large numbers of officers are now drawn from the ranks of the civilian professions and from the superior commercial classes. In spite of this, the efficiency of the German corps of officers is still extremely high, and the officer continues to occupy the foremost position in society; he gets plenty of invitations, and enjoys a very pleasant social life, whilst the fact of his being an officer often assists him to contract a good marriage.

The enervating effect of riches and luxury has not yet made itself felt to any serious extent. Few officers have much in the way of private means, and the presence of wealthy young officers is not encouraged. In Bavaria and other South German States the officer class is poorer than in Prussia, where the cult of money and amusement has made rather more progress, owing to the greater industrial development of North Germany. The German officer is a very hard-worked person, and has little time for games or recreation; he is fond of riding and shooting, and is encouraged in this taste. In the summer he has less leisure than in the winter; he has neither enough time nor money for polo, and rarely plays any game except lawn tennis.

Promotion from the ranks, as we understand the term, which is the source of supply of a large proportion of French officers, is practically non-existent in the German Army. The great majority of

German officers have, indeed, to pass through the ranks at the beginning of their military career, but they join, not as ordinary private soldiers, but as candidates for commissions, who have in most cases already been provisionally accepted by the Commandant and officers of the regiment.

The education and training of officers in the German Army may be divided into two parts:—

A. PRELIMINARY.

The supply of officers is drawn from two sources: (1) From the ranks, by the promotion to a commission of youths who join the ranks as candidates for commissions (*Fahnenjunker*); (2) from the cadet corps.

(1) *Fahnenjunker*.—Young men joining the ranks as candidates for commissions must be German subjects and not less than 17 years old. They must be physically fit, unmarried, and free from debt, and must be certified by the officer commanding the regiment as likely, from their parentage, bringing-up and intelligence, to become worthy members of the Corps of Officers. They must also produce a certificate from their *gymnasium* or school that they have been in the highest class (*Prima*) for one year, or, failing this, they must pass an examination (*Fähnrichs-Prüfung*) before the Superior Committee of Military Examinations in Berlin. This examination is framed with the idea that no special preparation should be required by the candidate, provided he has worked up to the proper standard at school.

The *Fahnenjunker* at first performs the duties and receives the pay of a private soldier. For the first six weeks of his service he generally has to live in barracks, as a matter of experience, but after that he is allowed to live in town and take his meals at the officers' mess. After three months' service he is usually promoted to the rank of lance-corporal, and a month or two later to the rank of *Unter-Offizier*.

After six months' service he may obtain his "military qualification" certificate. This certificate is signed by the officers of his company or corresponding unit, the battalion commander, and the officer commanding the regiment, and testifies that the candidate is worthy to serve on to become an officer, is physically and intellectually fit for the position, has shown zeal in the performance of his duty, and has made satisfactory progress in learning the duties of a private soldier and a non-commissioned officer.

On obtaining this certificate, he may be sent to a war school (*Kriegsschule*), and his name can be included in the monthly list sent in by units of candidates for appointment as ensign (*Fähnrich*). These lists are submitted to the Emperor, by whom nominations to the rank of ensign are made. A candidate cannot be appointed ensign after

he has completed his twenty-third year. An ensign ranks as a non-commissioned officer, next below the *Feldwebel* (company sergeant-major), but wears an officer's sword-knot on his side-arm.

(2) Cadets, as soon as they have passed through the upper second class of the *Hauptkadettenanstalt* at Gross Lichterfelde,¹ may present themselves for the ensigns' examination (*Fähnrichs-Prüfung*).

Of those who pass and are physically fit :—

- (i) Some are retained for a year to go through the *Selecta* class, whence they will issue direct as second lieutenants. (The course of the *Selecta* is the same as that of a war school.)
- (ii) The names of others are submitted to the Emperor for appointment to regiments as brevet (*Karakterisirte*) ensigns. This is now very rare.
- (iii) If the parents desire it cadets may remain at Gross Lichterfelde and pass through the lower and upper first classes; they can then be appointed ensigns after they have been through either or both of these. It takes a year to pass through each of the 4 classes, i.e., lower and upper second, or lower and upper first class.

Cadets who pass the ensigns' examination, but are not yet physically fit, join the lower first class.

Cadets who fail in the ensigns' examination may, in some cases, be recommended for a second trial; but, if not, they are either sent away from the school or placed in the ranks as privates, and in cases of exceptional good conduct as non-commissioned officers.

With the exception of the cadets of the *Selecta* class, all cadets have to pass through a war school before presenting themselves for the "officers' examination" (*Offiziers-Prüfung*) for a commission. After leaving the cadet school they are sent to the regiments of their selection (if possible) as non-commissioned officers for six months; they then proceed to a war school with the substantive rank of *Fähnrich*, and are here on the same footing as the ordinary (*Fahnenjunker*) *Fähnriche*. (See under War Schools.)

THE WAR SCHOOLS (*Die Kriegsschulen*).

Organization.—There are 11 war schools in all—10 for Prussia, Saxony and Württemberg at—

Potsdam	..	..	..	..	..	with 100 students.
Anklam	..	..	..	..	..	„ 96 „
Glogau	..	..	..	..	..	„ 100 „
Neisse	..	..	..	..	..	„ 107 „
Hanover	..	..	..	..	..	„ 120 „

¹ The *Hauptkadettenanstalt*, or Central Cadet School, is the Prussian establishment at Gross Lichterfelde; similar, but smaller, schools exist both in Bavaria and Saxony, at Munich and Dresden respectively.

Cassel	..	..	..	..	..	with 80 students.
Engers	..	..	..	..	..	„ 100 „
Metz	..	..	..	..	..	„ 120 „
Hersfeld	..	..	..	..	..	„ 92 „
Danzig	..	..	..	..	..	„ 108 „
One for Bavaria at Munich	..	..	..	..	..	„ 70 „

The object of the war schools is to afford instruction in the science of war to ensigns preparing for their “officers’ examination,” which they must pass before receiving their commissions as second lieutenants.

Staff.—Each school is commanded by a field officer, assisted by a lieutenant as adjutant. The instructional staff consists of eight captains (12 at Hanover and Metz), who are seconded from their regiments as instructors in tactics, administration, artillery and small arms, fortifications and military topography; and six lieutenants (eight at Hanover and Metz) attached to maintain discipline and to instruct in riding, fencing, gymnastics, drill, and musketry. One of the latter should have passed through the Military Gymnastic School, and another through the School of Musketry.

Horses for riding instruction are furnished by cavalry regiments as required. The director and captain instructors are seconded for a minimum of three and a maximum of five years, and those officers who instruct in tactics, administration, and military topography, must have passed through the Staff College. The lieutenant instructors must be unmarried, and must not be within four years of their promotion to captain.

Conditions for admission.—With very few exceptions all officers of the German Army, whatever their arm, must pass through the war schools as ensigns preparatory to passing the “officers’ examination” for a commission. They must have served at least six months with their regiments before admission to a war school; they must also be thoroughly acquainted with the duties of a private soldier, both theoretical and practical, and must have a good knowledge of the duties of a non-commissioned officer.

The exceptions referred to above are—

- (1) Men who have studied for at least one year at a university or certain higher-class technical schools, if allowed by a commanding officer to engage as *Fahnenjunker*, may at once be given the educational certificate required for an ensign, and may present themselves for their officers’ examination without having six months’ service. They must, however, be “chosen”² before being appointed to a commission.

² Before appointment, every candidate for a commission must be declared “worthy to be received amongst them” by a majority of the officers of his

- (2) The cadets of the *Selecta* class at the *Hauptkadettenanstalt* at Gross Lichterfelde.
- (3) Officers of the Reserve who are transferred to the active army. These are few in number, and they must first obtain the consent of the commanding officer whose regiment they desire to join.

Course of instruction.—Courses commence either on the 1st January, 1st April, 1st July, or 1st October. As each course lasts 35 weeks, and at the end of it the instructors receive four weeks' leave, a fresh course can be commenced every nine months, and there are four complete courses in three years at each school.

The course of instruction comprises tactics, artillery (including manufacture of ordnance, carriages, and ammunition), theory of gunnery and musketry, small arms, field and permanent fortifications, attack and defence of fortified positions, military topography, war games, English, French, and Russian, army organization and administration, and military correspondence. The practical course comprises tactical exercises on broken ground; visits to artillery ranges, to technical establishments, to engineer training grounds, and to fortresses; exercises in making up infantry ammunition; gun drill; musketry; field firing; riding and gymnastics.

The officers' examination.—At the end of each quarter the instructors give marks to each student, and if the sum total of these marks is sufficient at the end of the course, the ensign is allowed to present himself for the officers' examination. If the marks gained do not come up to the standard, the ensign is sent back to his regiment, but may be admitted to a second course.

The officers' examination is a purely military one on the subjects taught at the war schools. After passing it, the ensign's name is submitted to the Sovereign for a commission, a certificate that he has been "chosen" by his future brother officers, and another certifying to his practical professional attainments being submitted at the same time.

Ensigns who pass their officers' examination with honours receive commissions putting them senior to all others who became second-lieutenants at the same time. Those who fail may be allowed a second and last try after at least three months. Again, if they pass the examination but have bad marks for conduct, their commissions may be withheld for from two to six months.

regiment. This is no mere empty form. As the ensigns live in mess, the officers of a regiment have every opportunity of judging of their character. The majority must be in favour of admission, and, if the majority is against admission, the ensign has no right of appeal. Cases of rejection are, however, rare, as, generally speaking, if rejection is probable, the candidate gets a hint to retire or to apply for a transfer. This system is found to work very well, and certainly serves to exclude undesirable candidates.

General remarks.—There can be no doubt that the curriculum in vogue at these war schools is extremely sound and that the teaching is excellent. The instruction there imparted is undoubtedly of great value, and the foundation for the general efficiency of the German Corps of Officers is laid during the training received at the war schools.

One of the most important features of these schools is the very high professional attainments required from the staff and instructors. "The employment of an officer at a war school is an acknowledgment of his practical and scientific abilities." The lists of suitable officers are prepared with the greatest care, and if an officer recommended for an instructorship proves a failure, the fault is visited with much severity on the head of the commanding officer who made an error in judgment in recommending him.

The commandants of the war schools are selected from the most capable battalion commanders, usually men who have been on the staff; all the instructors are Staff College graduates or men who have been to the Military Technical Academy. The assistant instructors have nearly all passed through special courses, and are usually lieutenants recommended for the Staff College, who are glad to have more leisure than is possible at regimental duty to work up for the entrance examinations.

The war school course is eminently a practical one, and the young German, when he has completed it, is fully qualified in every way to fulfil his duties as an officer.

We have already seen that almost every candidate for a commission must pass through a war school, so that nearly all officers commence life in the army with the same foundation for future instruction.

GERMAN CADET SCHOOLS FOR OFFICERS. .

Organization.—The cadet schools consist of—

9 Prussian schools, viz., the Central Cadet Institution (*Hauptkadettenanstalt*) at Gross Lichterfelde, and 8 cadet houses (*Kadetten-Häuser*), or preparatory cadet schools (*Vor-Korps*), at Bensburg, Cöslin, Karlsruhe, Naumburg, Oranienstein, Plön, Potsdam, and Wahlstatt.

1 Saxon at Dresden.

1 Bavarian at Munich.

The number of cadets at the Central Cadet Institution is 1,000, organized in two battalions of five companies each: at each of the cadet houses 220 (two companies each), and at each of the Saxon and Bavarian institutions 180 (two companies each), making a total of about 3,120.

The object of the cadet corps is to impart instruction and training

to the sons not only of officers but of all classes of the community, with a view to their entering the military service.

The Prussian Cadet Corps are under a major-general or colonel, with two captains or lieutenants as staff officers: headquarters at Berlin.

The Saxon and Bavarian Cadet Corps are similar in character to that of Prussia.

In Prussia boys are sent, on first joining, to one of the cadet houses, and, as they grow older, are drafted into the Central Cadet Institution, where they remain till they pass their examination for ensign (*Fähnrich*).

Conditions for admission.—Admission to the Cadet Corps takes place once a year, on the 1st April. All candidates must be between the ages of 10 and 15. They have to undergo a medical inspection and pass an examination of graduated difficulty according to age, to test whether their education is sufficiently advanced to enable them to take their places in the classes corresponding to their ages.

There are three categories of cadets:—

- (i) Royal (Prussian) cadets, who are received either gratuitously or on payment of a small annual fee varying in amount, but never exceeding £20.
- (ii) Boarding cadets, who are received up to the number of vacancies available after all the Royal cadets have been taken in. They pay a fee of about £40 per annum, including all extras.
- (iii) Outdoor cadets, who pay an annual fee of £3.

Royal cadetships may be given to the sons of officers who have been killed in action, have died of wounds, or have been invalided on account of active service; of those who have died while serving; of those actually serving; of those on the pensioned list; of those who have died after retiring from the Army, provided they have served through one campaign; and finally, to the sons of persons, *e.g.*, doctors and civilian officials, holding the relative position of officers. The sons of non-commissioned officers who have been killed in action, or who receive a pension for wounds, or who have served honourably for 25 years, and those of civilians who have done good service to the State, may also receive Royal cadetships.

Claims to admission as Royal cadets are settled by a Royal Committee in Berlin, composed of the Inspector-General of Military Education, delegates from the Ministry of War, the Commander of the Cadet Corps, and the Commander of the Central Cadet Institution.

Applications to enter the Corps as boarding or outdoor cadets are decided upon by the Commander of the Cadet Corps. All legitimate children of Prussian subjects are eligible for admission to the Prussian schools.

THE CADET HOUSES (*Kadetten-Häuser*) OR PREPARATORY CADET SCHOOLS.

The age of the boys at these institutions is from 10 to 15. The course of instruction is that of the lowest 5 classes of the *Realschule*, corresponding to that of the modern side at an English public school. The subjects taught are Scripture, Latin, German, French, English, arithmetic, algebra and geometry, ancient and modern history, rudiments of natural philosophy, drawing and writing. Besides these, the cadets receive instruction in drill, gymnastics, bayonet exercise, swimming, and dancing.

Each cadet house is commanded by a field officer, with two captains as company commanders, who are responsible for discipline.

THE *Hauptkadettenanstalt*, OR CENTRAL CADET INSTITUTION, AT GROSS LICHTERFELDE.

At the age of 15, cadets of good character who are likely to make good officers and have attained the necessary standard of knowledge, are drafted to the main cadet school, *i.e.*, *Hauptkadettenanstalt*, at Gross Lichterfelde. Here they are kept either for three years, if they go to the *Selecta* class, or for four years, if they pass through the *Unter* and *Ober Prima* classes. If they were backward in their work at the preparatory cadet schools or delayed by ill-health, they may be sent on to Gross Lichterfelde a year later, *i.e.*, at the age of 16.

There are four classes other than the *Selecta*, *viz.*, *Unter* and *Ober Secunda*, *Unter* and *Ober Prima*. Each of these takes a year to get through, so that the complete course lasts for four years. When, however, the cadets have passed the *Ober Secunda*, *i.e.*, after two years at the school, they may elect to go into the *Selecta* class, for which they are then chosen, if they are considered to be fitted for it by their officers.

The subjects taught in the other four classes include German, French, English, Latin, mathematics, history, Scripture, and drawing, as compulsory subjects; Russian, chemistry, physics, &c., are voluntary. The course of study is therefore nearly the same as that of a German *Real-Gymnasium* or English public school (modern side). The physical exercises include drill, riding, swimming, gymnastics, bayonet exercise, fencing, games, and dancing.

When, at the end of the four years (the cadets now being 19 to 20 years of age), they have passed successfully through the highest or *Ober Prima* class, they are sent to regiments for six months' training in the ranks and as non-commissioned officers. At the end of this period, provided they are passed as efficient, they are sent to a War School with the substantive rank of *Fähnrich*, and remain there for nine months. They then go up for their final officers' examination, and, if successful, are appointed officers, their commissions

being antedated about $2\frac{1}{4}$ years, the same date as the cadets (their contemporaries) of the *Selecta* class, but senior to the latter.

The course in the *Selecta* class lasts for a year, and includes only military subjects and languages, being in fact practically exactly the same as that of a War School. At the end of this year cadets who pass out successfully are appointed second-lieutenants and gazetted to regiments without further delay. Thus they become officers within three years of joining the *Hauptkadettenanstalt*, and at the age of 18 or 19.

The others spend four years at the cadet school and 15 months subsequently before getting their commissions, so that they take $5\frac{1}{4}$ years in all. Their commissions are, however, antedated $2\frac{1}{4}$ years—to the same date as those of their comrades of the batch who went to the *Selecta* class when they joined the *Unter Prima* class—and senior to the *Selecta* cadets, so that they gain in the end.

The object of this system is to enable those boys who are physically and mentally fitted to become officers, and who do not take kindly to book learning, to avoid two years of irksome and uncongenial studies. The cadets who are allowed to join the *Selecta* class are usually boys who are well-developed as regards character and physique, who are smart and keen on soldiering, but have no thirst for further educational training, and are unlikely to benefit much by two years' additional book work.

The others may include boys who are well-developed, both mentally and physically, who are smart and keen but also anxious to continue their studies, and will further consist of cadets who are backward and likely to benefit by two years more of training and discipline under a strict military *régime*. Much importance is attached, as is well known, to educational qualifications in the German Army, so the boys who stay on and pass through the *Unter* and *Ober Prima* classes, and then spend 15 months in regimental life and at war schools, are ultimately placed senior to their *Selecta* comrades. The latter, on the other hand, gain slightly as regards pay during this period, and have the satisfaction of becoming officers sooner, while the boys who stay on have more examinations and tests to pass than the others, and failure results in their being put back or even altogether removed. It is clear, therefore, that the *Selecta* cadets enjoy substantial advantages, and although most of the others will probably become senior to them in the end, yet all the commissions will bear the same date. The fact of the *Selecta* cadets being placed below their comrades may make no difference, whilst it is certainly always a case of "the bird in the hand as against two in the bush."

The organization is as follows:—

The Commandant is a colonel or lieutenant-colonel, assisted by a major as assistant commandant, and by a lieutenant as adjutant.

The number of cadets is 1,000, divided into two battalions, each of five companies, each 100 strong. Each battalion is commanded by a major, assisted by an adjutant. Each company is commanded by a captain, assisted by four subaltern officers, who must be unmarried. The captains may or may not be married—preferably the latter.

There are eighteen officer instructors, who teach military subjects and languages. In addition to these there are doctors, administrative officials, and other non-combatants. The military staff at present consists of 75 officers, viz., school staff, 3; battalion staffs, 4; company officers, 50; and instructors, 18.

There are some 25 civilian instructors for non-military subjects.

The *régime* is purely military, and is of Prussian rigidity and strictness. The daily programme (summer) is as follows:—

<i>Réveillé</i>	..	..	..	5.55 a.m.
<i>Appell</i> (roll call)	..	..	..	6.30 „
Marched to prayers	..	..	..	6.35 „
„ „ breakfast	..	..	..	6.50 „
„ „ quarters	..	..	..	7.20 „
Studies	..	..	..	7.30 to 12.30, with 15 minutes' break about 10.30.
Roll call	..	..	..	12.45, at which daily orders are read, letters given out, &c.
Marched to dinner	..	..	..	1 p.m.
„ from dinner	..	..	..	1.50 p.m.
Walk about parade ground or play games there	..	..	..	2 to 2.30 p.m.
Studies	..	..	..	2.40 to 4.45 p.m.
Tea interval	..	..	..	4.45 to 5.30 p.m.
Physical exercises, i.e., drill, swimming, gymnastics, riding, games, &c.	..	..	..	5.30 to 7.30 p.m.
Marched to supper (light)	..	..	..	7.40 p.m.
„ „ quarters	..	..	..	8.15 „
Evening studies	..	..	..	8.30 to 9.30 p.m.
Lights out	..	..	..	10 p.m.

The programme is very similar in winter, except that cadets get up half-an-hour later, and physical exercises take place after lunch instead of in the evening.

The standard of games has gone up very much. Much importance is attached to swimming at Gross Lichterfelde. In one company, early in 1911, all the 100 boys could swim and dive in head first.

Riding is only practised by the *Selecta* class and the *Ober Primaner*.

Gymnastics are done twice a week as a rule. There are also appliances in the square, which are used by some of the boys during the brief intervals, whilst others are playing tennis or hockey, kicking a football about, &c.

The drill is good. Each year the cadets take part in big reviews before the Kaiser, and a great deal of strenuous practice is carried out preparatory to these momentous occasions.

Dancing is also taught, and a few highly ceremonious dances are held, to which ladies are invited.

Cadets sleep in dormitories of six to seven and have day rooms for a similar number. There is very little comfort. Bath-rooms are conspicuous by their absence, but the swimming bath is a great improvement on the Sandhurst bathing pond.

Cadets are always in uniform, even when on leave.

Gross Lichterfelde has an annual output of some 270 to 300 cadets as officers or would-be officers. The supply from this source is therefore smaller than that from the State schools—in fact, only about one-quarter of the total supply. The general impression is that the cadets make better officers on the average than the others. The money spent on this school and the preparatory cadet schools is looked upon as a most profitable investment, as this free, or at all events very cheap, education of the sons of officers and officials serves to maintain this important and valuable source of supply. Otherwise, the pay of these classes would be insufficient for them to send their sons into a military career.

This fact, as well as the many reductions made for officers, *e.g.*, railway and theatre tickets, &c., must be taken into account in comparing the relative pay of English and German officers.

An appointment as instructor, company commander, or officer at the *Hauptkadettenanstalt* is looked upon as advantageous and a good billet, but chiefly as a relief from the monotony of regimental life. The pay is the same as that of the regimental officer plus Berlin allowance, and the married company commanders have rather a hard struggle; they cannot live on their pay if they have children, although their expenses as regards entertainment are very small. A captain gets about £250 per annum and pays £90 for his quarters. He keeps a horse, for which he obtains forage and stabling. Most captains take no outdoor exercise except hacking their horses about; they say they are very hard-worked. None of the officers, instructors, or company commanders, count as being on the General Staff.

No attempt is made to separate the cadets in view of the different arms they may wish to join—cavalry, infantry, artillery, &c. In fact, a number of cadets elect to join the navy each year—in one company 3 out of 28 last year.

The system of non-commissioned officer cadets resembles our Woolwich and Sandhurst methods; the senior cadets are appointed lance-corporals (*Gefreite*) and non-commissioned officers, and assist the officers in maintaining discipline. Non-commissioned officers have extra pay and various privileges.

A large number of foreigners—Japanese, Chinese, Turks, Brazilians, Chilians, Siamese, &c.—have of late years been educated at Gross Lichterfelde. A Siamese prince was there last year attached to a company, but living outside with a Prussian officer as special tutor, and only attending studies and certain physical exercises. The visits of Japanese have now become rarer, and it is suggested that they have discovered and learned all they want to know of German methods.

The German cadet schools really form a sort of gigantic charitable institution for the sons of officers and civilian officials, and must cost the State a great deal of money. No boy pays more than 800 marks (£40) per annum, and the others pay rates in proportion to the income and position of their parents, many of them being educated free of all charge. These rates include all uniform, linen, underclothing, books and, of course, food, except afternoon tea. All the boys have to wear exactly similar clothing, uniform, shirts, vests, socks, boots, &c., and no garments other than those issued officially may ever be used. The boys' pay varies from 1 mark 20 pf. (1s. 2d.) a month in the case of ordinary cadets, to 4 marks per mensem in the case of the *Kompagnie Führer* (corresponding to a colour-serjeant at Sandhurst). Pocket money must be at least 3s. per month, but must not exceed 9s. The greatest care is taken to prevent boys from receiving larger sums of money from their parents, relations, or friends.

The surveillance of the cadets is very close. The company commander's quarters are on the ground floor. Above him live the cadets, with an officer instructor at each end of the corridors and two more in the middle. These officers, always in uniform, are constantly with the boys; they do not instruct them in any book subjects, but only in the various physical exercises. They are called *Offizier Erzieher*, and this is their rôle, the Prussian idea being that close touch and constant supervision are the best means of training character and developing the qualities desirable and necessary for the officer. The system would be intolerable to English boys, but appears to work all right for these Prussian cadets, who have, since the age of 10 (and earlier, from the cradle, at home), been taught to look upon discipline and implicit obedience to superiors as the greatest of all virtues. And it must not be supposed that these boys lack spirit; they almost "look for trouble" from those who are not their superiors in the military hierarchy—they will stand anything from a *Vorgesetzter*, but are at once up in arms against any outside interference, and will brook no insult or even slight. Their whole training is directed to the perfection of discipline; they believe in it firmly. They are taught to delight in implicit and immediate obedience to the *Vorgesetzter*, and to look upon it as the glory and secret of efficiency of the German people. At the same time, it must be remembered that every effort is made to ensure the very careful education and

training of those whose duty it is to give orders, so that these orders may be correct and given at the right time and place. Although soldiers and officers of all ranks are taught to obey and respect the coat and the rank of their superiors rather than the man—somewhat unlike the system obtaining in England, France, and the United States—such discipline could not be maintained without hard work and thorough training and efficiency on the part of the superiors. And it must be admitted that these “superiors,” whatever their rank, are extraordinarily efficient, and know their work most thoroughly and completely.

B.—THE HIGHER EDUCATION AND TRAINING OF GERMAN OFFICERS.

The commanders of the units to which young officers are appointed are responsible for their further education and training, *i.e.*, company, squadron, or battery commanders, &c., and, in a lesser degree, the officers commanding the battalions, regiments, and *Abteilungen*. It is the duty of the former to see that their subalterns become efficient instructors, to instil professional keenness into them, to give them the benefit of their own experience, and to assist them in every way to develop their military knowledge and value to the Army. In the late autumn and winter the main duties of the young officer consist in drilling his recruits,³ teaching them musketry and riding (cavalry), lecturing to them on military subjects, patriotism and military history, attending lectures, war games, doing winter essays, &c., studying military history, and generally developing his professional attainments. In the late spring, summer, and early autumn the work is mostly outdoor, company, battalion, and regimental training, musketry, field firing, &c., culminating in brigade, divisional, and army corps manœuvres. The young officer is kept extremely busy; he has to impart a great deal of knowledge, and also to spend much time in acquiring knowledge himself and in perfecting his own military attainments; he gets very little leave, only two or three weeks in the year in all probability. In one respect, at least, he is better off than the British officer; he has no promotion examination to pass throughout his career.

As in France, attachments of officers to other arms are common throughout the German army, and are not confined to staff college students; the high value of this method of education is fully realized and every effort is made to widen and extend the system of interchange between officers of the various arms.

However good and sound the system of regimental training may be,

³ It must be remembered that in the German Army, and especially in the dismounted branches, where the period of compulsory service with the colours is for two years, the number of recruits to be trained annually is very much greater than in the British Service; their instruction and training are carried out in the companies.

it is recognized that it is inadequate and must be supplemented by outside instruction, which must be given by experts. A number of educational establishments exist in the German Army for the purpose of imparting this expert information and knowledge, and these may be divided into two classes :—

- (a) Educational establishments of a technical nature.
- (b) Higher schools for staff training.

(a) *Educational Establishments of a Technical Nature.*

(1) *Schools of Musketry (Infanterie-Schiessschulen).*

Organization.—There are two schools, a Prussian school, situated at Spandau, and a Bavarian one at Augsburg.

The Prussian school is commanded by a colonel, assisted by a lieutenant-colonel or major, and by a subaltern as adjutant. The staff consists of 4 majors or captains as senior instructors, 10 first lieutenants (*Oberleutnants*) as assistant instructors, a paymaster, and a medical officer. At present 4 additional assistant instructors are attached to the school.

The Bavarian school is commanded by a lieutenant-colonel, with a staff of 5 majors and captains as instructors, and 2 first lieutenants as assistant instructors.

The objects of these schools are the training of musketry instructors and expert shots, and the dissemination of a thorough knowledge of the service small arms and of the regulations dealing with them and their ammunition. The schools are also required to point out any defects in the Musketry Regulations, to submit suggestions for their improvement, and to follow the development of musketry questions in foreign countries.

Courses of Instruction.—The number of courses held at the German musketry schools vary from year to year ; they usually consist of three different classes :—

- (1) "Information" courses for colonels, lieutenant-colonels, and majors of infantry and cavalry, lasting about 10 days.
- (2) "Instructional" courses for captains and subalterns of infantry and cavalry, lasting for 3 weeks.
- (3) "Exercise" courses for non-commissioned officers.

(2) *The Instructional Machine Gun Company (Die Lehr-Maschinengewehr-Kompagnie).*

This company was formed on the 1st October, 1911. It is attached to the School of Musketry at Spandau, and has a strength of 1 captain, 3 subalterns, and 71 rank and file.

(3) *The Instructional Infantry Battalion (Das Lehr-Infanterie-Bataillon).*

The object of this unit is to try new drill formations, equipments, &c., and to regularize the system of drill throughout the Army.

The battalion is quartered at Potsdam, and has 22 officers and 752 rank and file. The course lasts for one year.

(4) The Military School of Gymnastics (*Militär-Turnanstalt*).

The object of this school is to train officers of all arms as efficient instructors of gymnastics and fencing. The school, which is situated at Berlin, is under a major, assisted by one captain and two subalterns as instructors, with a number of non-commissioned officers as assistant instructors, the latter being attached to the school during the courses.

There are two courses annually, each lasting 5 months, and each attended by about 130 officers.

(5) The Schools of Military Equitation (*Militär-Reit-Institute*).

There are two schools ; one Prussian, situated at Hanover, and one Bavarian (*Equitations-Anstalt*), at Munich.

The object of these schools is to train officers (and non-commissioned officers) to be bold and dashing riders, and to teach them the higher and more scientific side of horsemanship, so that they may become really efficient instructors.

The Prussian school is under a major-general of cavalry, assisted by two field officers, two adjutants, and 14 instructors who are either majors or captains. The course lasts for 2 years, beginning on October 1st, and 66 officers join each year. These officers are all subalterns from the cavalry and field and horse artillery. They must have at least 3 years' service, and must be active, fairly light, and of strong constitution.

The course is very thorough and complete, and includes instruction in riding, breaking horses, horsemastership, veterinary science, musketry, gymnastics, fencing, cavalry pioneer work, demolitions, and the employment of carrier pigeons. The instructors for the non-commissioned officers' course are selected from the second year officer pupils.

During the first year an officer rides his own horses and one cadre horse. In the second year he rides daily two remounts, a school (*haute école*) horse and his own horses.

A pack of hounds is kept at the school, and riding to this forms part of the course. The hounds are hunted by one of the instructors, the whips being chosen from the second year officer pupils. During the winter the wild boar is hunted, whilst there is drag-hunting in the summer.

There are about 700 horses at the school, including cadre horses, remounts, *haute école* horses, horses for the non-commissioned officers' school, and horses brought by the officers themselves.

Refresher courses for field officers, lasting one month, and attended by 25 cavalry field officers, are held every summer. The object of this course is to assist future commanding officers in forming their ideas

and theories regarding training, and to show them what well-trained horses and men can do.

(6) Officers' Riding Schools (*Offizier Reitschulen*).

These schools are intended to supplement the Schools of Military Equitation, which have been found inadequate for the training of all the Cavalry and Field Artillery officers of the German Army. Up to the present only two of these schools have been formed, one at Paderborn, and one (Saxon) at Dresden. Three more Prussian schools are to be established shortly.

The course at Paderborn lasts for 9 months, from October 1st to July 1st, and is attended by 40 subaltern officers. The officers are instructed in riding, use of arms, horsemastership, drill, musketry, veterinary science, gymnastics, and war games. Towards the end of the course the pupils are exercised in skeleton formations, as squadrons, regiments, or brigades.

The Paderborn school is commanded by a major, assisted by 3 captains as instructors.

(7) The Military Technical Academy (*Die Militärtechnische Akademie*).

The object of the Academy, which is situated at Charlottenburg, is to give officers of all arms the opportunity of studying the technical science of engineering and communication services, and to enable officers of Foot Artillery, Engineers, and Pioneers and Communication Troops to acquire the technical knowledge required by those arms.

The Director of the Academy is a lieutenant-general, assisted by a colonel or lieutenant-colonel as assistant director, and a major or captain as adjutant.

Four field officers of the Field and Foot Artillery, Engineers and Communication Troops respectively, act as members of the directing staff. They superintend the studies of the students of their branches of the service, and they constantly attend lectures and practical work in order to observe the progress made by individual officers and to keep in touch with the instructors.

Three first lieutenants of the Field and Foot Artillery and Engineers respectively are attached as officers of the directing staff. They supervise the interior economy of the establishment, act as assistant instructors, are in charge of the scientific collection, the secret books and the mess, and give instruction in riding.

The Director is President of the Studies Committee, a body composed of the above-mentioned 4 field officers, a field officer of the General Staff, a field officer of the Ordnance, a field officer of the Small Arms Committee, and a number of Professors from the Technical High School at Berlin. The functions of this body are to express opinion on the curriculum and methods of instruction, and to inspect the annual examination papers and the scientific collection.

There are 17 military instructors, several assistant instructors, and a number of civilian professors.

Courses of Instruction.—The subjects taught include instruction in :

- (1) Matters connected with armament (*Waffenwesen*), including mathematics, mechanics, physics, inorganic experimental chemistry, ballistics, tactics, air craft, mechanical transport, languages, riding, and fencing.

There are five different courses on armament, each lasting a year ; few officers, however, attend them all. Some officers only do one course, but the majority stay on for the second course ; only a small number, who show special aptitude, are selected to attend the courses of the third and fourth years, in order to undergo more advanced instruction in special technical subjects, such as construction of arms, engineer works, electro-technics, bridges, and machinery. The fifth course is the "*Fussartillerie-Lehrgang*," a special course which all officers of the foot artillery have to attend.

- (2) Matters connected with engineer services (*Ingenieurwesen*), including mathematics, mechanics, physics, fortress construction, fortification, chemistry, electro-technics, armament, fortress warfare, armour and armour concrete, explosives, tactics, air craft, languages, riding and fencing.

There are four different courses, each lasting a year, and all officers of the engineers and pioneers must attend the first two.

- (3) Matters connected with communication services (*Verkehrswesen*), including mathematics, mechanics, physics, chemistry, machinery, railway construction, railway traffic management, military bridges, field and State telegraphs and telephones, mechanical transport, transmission services in war, air craft, tactics, languages, riding, and fencing.

There are four different courses, each lasting a year, and all officers of the communication troops must attend the first two.

Bavarian officers may attend all these courses, and their number is fixed by the Bavarian Ministry of War.

Examinations and Certificates.—Examinations are held at the end of every year. Students are given certificates at the conclusion of their tour at the Academy detailing the results obtained.

A special report is made by the Director on all officers who have been at the Academy for two years, stating for what appointments each is best fitted.

- (8) The Bavarian Artillery and Engineer School (*Artillerie- und Ingenieur-Schule*).

This institution is at Munich, and is organized almost exactly on the lines of the Prussian Military Technical Academy, but on a much

smaller scale. The staff consists of a Director, assisted by seven military instructors and several civilian professors.

(9) The Field Artillery School of Gunnery (*Feldartillerie-Schiessschule*).

The object of this school, which is situated at Jüterbog, is to afford instruction to officers of the field artillery at various periods of their military careers, to investigate important field artillery questions, to carry out experiments, and to study the methods and progress of other countries.

The school is commanded by a major-general, assisted by two field officers and an adjutant (at present a captain), and a staff of 19 instructors, of whom 2 are lieutenant-colonels, 3 majors, and 14 captains.

The practical part of the instruction is carried out by means of a special regiment of field artillery, consisting of two *Abteilungen* of field guns and one *Abteilung* of howitzers, each of three batteries. This regiment, which is called the Instructional Regiment (*Lehr-Regiment*), is permanently at the school.

Courses of Instruction.—The following courses are held annually :—

- (i) Two courses of about four months each for 10 or 11 field officers, 37 captains, and 46 lieutenants. Field officers only attend for about a month.
- (ii) Two courses of about four months each for 100 second lieutenants.
- (iii) Four courses of six weeks each for 9 captains, 78 lieutenants and second lieutenants of the Reserve.

Instruction is given in the following subjects :

Course (i).—Service practice and tactical handling of field artillery, in so far as the occupation of positions is concerned.

The care and use of equipment.

General instructions regarding field artillery of other countries.

Course (ii).—Theoretical and practical instruction with reference to the use of the gun.

The duties of section commander.

Battery fire discipline and tactical handling as regards occupation of positions.

General instruction regarding field artillery of other countries.

Course (iii).—As for (ii), except that care and use of equipment is substituted for instruction in the field artillery of other countries.

In addition to the above regular annual courses, information courses of short duration are held for general officers of infantry, cavalry and artillery.

(10) The Foot Artillery School of Gunnery (*Die Fussartillerie-Schiessschule*).

The object of this school, also situated at Jüterbog, is to provide instruction for officers and non-commissioned officers of the Foot Artillery, to elaborate improvements in methods of firing, to carry out experiments, and to study the methods of foreign armies.

The school is commanded by a colonel, assisted by a field officer, a captain, and a first lieutenant as adjutant. There are eight instructors, of whom five are majors and three captains.

A battalion (four batteries) of Foot Artillery is posted permanently at the school for instructional purposes.

Courses of Instruction.—The following courses are held annually :—

- (i) Two courses for senior officers, lasting about three months each, including 30 practice days. These are attended by about 12 field officers and general staff officers, and by some 30 captains or lieutenants.
- (ii) One course for junior officers, lasting about a month, from 1st to 29th September, including 23 practice days. This is attended by junior officers who have completed the first course at the Military Technical Academy.
- (iii) One course for Reserve officers, lasting about two months, from the 10th January to the 6th March, including 23 practice days. This is attended by about 30 officers of the Reserve.
- (iv) Two courses for non-commissioned officers, lasting about four months each.

In addition to the above, courses for divisional and brigade commanders and for Field Artillery field officers are held annually as follows :—

- (i) An information course of 10 days' duration for divisional commanders who are not Foot Artillery officers and for Field Artillery brigade commanders.
- (ii) A field officers' course, lasting about a month, for field officers of the Field Artillery.

(11) The Cavalry Telegraph Schools (*Die Kavallerie-Telegraphenschulen*).

There are two of these schools, one Prussian at Berlin, one Bavarian at Munich. They are intended for the training of cavalry officers and men in the duties connected with the cavalry telegraph equipment.

The Prussian school is under the command of the officer commanding No. 1 Telegraph Battalion, to which it is affiliated. A captain of cavalry is principal, with a staff of eight lieutenants as instructors.

There are courses for both officers and non-commissioned officers, the former lasting five months.

(12) The Technical High School (*Die Technische Hochschule*).

This establishment, situated at Charlottenburg, is a university entirely under civilian management, which is attended by officers nominated by the Minister of War who have passed through the Military Technical Academy.

The course lasts for two years, except in the case of railway troops, who remain three years; the number of officers at the university is generally about 120.

The course includes technical instruction in architecture, mechanical and electrical engineering, civil, mining, and marine engineering, physics, chemistry, and general sciences.

(b) *Higher Schools for Staff Training.*

Staff Colleges (*Kriegsakademien*).

There are two staff colleges, one at Berlin and one at Munich. The Munich establishment is for Bavarian officers only, whilst that at Berlin is attended by officers from Prussia and all the other States of the German Empire.

The Berlin Staff College.

Staff.—The commandant ("*Direktor*") is a full general. His staff consists of a colonel as assistant commandant and a major as adjutant, with two majors and a captain as members of the directing staff (*Direktion*).

The instructional staff is partly military, partly civilian; some of the instructors devote all their time to their work at the college, whilst the remainder consist of soldiers or civilians of special ability holding important posts in the Army or in the scientific or scholastic world. There are 14 permanent military instructors, 1 naval captain (*Fregatten-Kapitän*), and several medical and civilian permanent professors, in addition to a number of officers and civilians who act as occasional lecturers and instructors, whose time is not entirely devoted to their work at the college.

The commandant is assisted by a Studies Committee, of which he himself is president, with six members, including four general officers of the general staff, one general officer (inspector-general of pioneers), and the adjutant of the college as secretary. The rôle of this body is to assist the commandant in arranging the entrance examination, working out the programme of instruction, selecting instructors, preparing examination papers, discussing the value of work submitted, and drawing up the final certificates.

Conditions for Admission.—The number of students at the college is about 480, divided into three batches of 160 each.

Entrance is by competitive examination only. Although theoretically no "nominations" are given, in practice, the chief of the

general staff occasionally nominates an officer of particular merit, who has, by reason of illness or special duties, been prevented from competing in the examination, or has had insufficient time to prepare for it; this is, however, of rare occurrence, and the officer in question must present himself for the entrance examination the following year, and, if unsuccessful, has to leave the college. The British system of allotting a certain number of vacancies to infantry, artillery, &c., does not obtain; the competition is open to all arms of the service, and there is no restriction as to the proportion of officers that may be admitted from each arm.

Much importance is attached to the character and ability of candidates, to their practical acquaintance with regimental work, and to their health and professional keenness. The commanding officer of each candidate has to furnish no less than six separate certificates dealing with these and other qualifications, and if, after joining the staff college, the opinions expressed in these certificates turn out to be inaccurate and misleading, severe measures are taken with the commanding officer.

Officers cannot quite live on their pay whilst at the staff college, from £30 to £50 extra per annum being necessary. As a large proportion of German officers have little or no private means, the commanding officers of regiments may authorize a grant from the "Officers' Assistance Fund" (*Offizier Unterstützungsfonds*). As this is a regimental fund, supported by Government aid and officers' subscriptions, commanding officers are unlikely to grant pecuniary assistance from it to any but really needy and deserving officers. Officers may also obtain small loans from the official loan chest (*Offiziers Darlehnskasse*).

Although officers are not forbidden to call in the aid of crammers in preparing them for the entrance examination, this system of working is discountenanced, and candidates have to submit a paper, countersigned by their commanding officers, showing their method of preparation for the examination, whether they went to a crammer's, and, if so, for how long.

In addition to the above-mentioned certificates, &c., candidates must fulfil the following conditions before being allowed to compete :—

- (1) At least three years' service.
- (2) Promotion to captain unlikely to take place for five years.
- (3) Good health and bodily fitness.
- (4) Private affairs in good order.
- (5) Must have shown special professional keenness and efficiency.
- (6) Must possess character and personality suitable for employment on the staff.

The Entrance Examination.—The papers are set under the orders of the Chief of the General Staff, the subjects of the examination being as follows :—

- (1) Applied tactics.
- (2) Theoretical tactics.
- (3) Artillery and small arms.
- (4) Military engineering.
- (5) Military topography.
- (6) Military history.
- (7) Geography.
- (8) A foreign language, English, French, or Russian, or mathematics. (Mathematics may only be taken by officers electing to study mathematics during their stay at the college.)

The examination is entirely in writing, although the language paper includes a piece read out in German, which has to be translated at once into the language.

The examination is held at the headquarters of each Army Corps, under the orders of the Chief of the General Staff of the Army Corps. The papers are first read, criticised, and marked by a board assembled for the purpose at Army Corps headquarters, and then forwarded to the Commandant of the Staff College. He submits some 200 of the best to the Studies Committee, who examine them carefully and place them in order of merit. The report of the Studies Committee and the results are then sent to the Chief of the General Staff, about 160 candidates being adjudged successful and ordered to join the college.

Course of Instruction.—The course at the German staff colleges lasts three years. There is an examination at the end of each year, and students are liable to be removed from the college if they fail in these examinations, and if their general work or conduct is also considered unsatisfactory. Students are nominally appointed for one year only, so that their removal really only amounts to not being reappointed. As a matter of fact, it is rarely found necessary to dismiss any of the officers before the expiration of their full three years; the certificates demanded from commanding officers are very complete, and the latter are unlikely to recommend any candidates of whose zeal and ability they are not confident, owing to the fact that the failure of the nominee to fulfil expectations is invariably visited on the commanding officer. Students are all subalterns and, on the average, a great deal younger than those at Camberley or Quetta.

Very little leave is given during the three years; only a short week at Christmas and Easter, and sometimes the last few days of September, between the end of manœuvres and the reopening of the college. The annual course of instruction at the college itself lasts from the 1st October to the 30th June, most of the work being indoors, although a certain amount of outdoor work is done in May and June. During their second year, officers go on a three weeks' survey tour, whilst in their third year they do a three weeks' staff ride, which serves as their final examination in staff duties. Officers also visit fortresses and battle-fields, and study the frontier defences on the ground.

Each year all the staff college students are attached to troops of arms other than their own for three months, from the 1st July to the end of September. During this period they are treated exactly like officers of the unit to which they are attached; for instance, infantry officers are put in command of cavalry troops and squadrons, of sections and batteries of field artillery; cavalry officers command infantry sections and companies, sections and batteries of field artillery, and so on. Officers are made to study very carefully and thoroughly the characteristics and peculiarities of the troops to which they are attached, their system of administration, and tactical methods. They do not only command units of these arms on paper or on the parade ground, but also at practice camp and on manœuvres. Students are also attached to the staffs of army corps, divisions, and brigades during manœuvres, either as assistant staff officers, gallopers, or narrative officers; they are also occasionally employed as assistant umpires. Altogether, German officers do no less than 9 months' duty with other arms during their 3 years' course, whilst the British staff college student is only attached to other arms for a total of 2 months. French staff college students, although their course only lasts two years, like our own, are attached to other arms for 8 months in all, 6 months before joining, and 2 months after leaving the college.

Students do not live at the college itself, where there is only a mess (at which they take occasional meals and sometimes attend official banquets), and a fine, large library, where they can obtain practically all the books they require. The great advantage of unmarried officers living together, of getting to know each other well, and of passing on their varied experience to each other, is therefore lost. The work is more individual than at our Staff Colleges, a fact which would appear to afford less scope for the development of character and personality than the British system of working mainly in "syndicates."

The subjects taught are divided into two classes, compulsory and voluntary.

Compulsory subjects include the following :—

Tactics, strategy, military history, artillery and small arms, military engineering, siege warfare, military topography, staff duties, railway and telegraph work, communication services, the rôle of air craft, naval warfare, oversea expeditions, colonial warfare, state administration, military and international law, military hygiene, military and general geography, and one language, English, French, or Russian.

Students must attend all lectures on compulsory subjects, as also on the voluntary subjects which they elect to take up. The number of hours devoted weekly to lectures on military subjects is from 16 to 20 throughout the course.

Voluntary subjects.—Mathematics, physics, chemistry, geology, geodesy, plan drawing, and languages—English, French, Russian, or

Japanese. Special arrangements are made for officers desirous of studying other languages, such as Italian, Spanish, Turkish, or Chinese.

Very good facilities are afforded for the study of these subjects, especially of languages, the attainment of real proficiency in which is much encouraged at the staff colleges, as indeed throughout the German army. Officers probably spend 8 to 10 hours per week attending lectures or undergoing instruction in those of the above voluntary subjects which they have selected. In all, therefore, German Staff College students attend about 25 to 30 hours' lectures per week, including both obligatory and voluntary subjects.

Riding.—A riding school was established in 1907, at which officers of the dismounted arms, who are not efficient riders, receive instruction for 2 hours a week. There are 60 horses attached to this riding school, which is commanded by a captain of cavalry, assisted by a first lieutenant. Officers at the Berlin staff college have no time or opportunity for other riding, except hacking their horses, if they have any, in the Tiergarten or elsewhere for an hour or so; they neither have time nor opportunity for hunting with a "drag." Outdoor means of recreation are few; there is no occasional game of polo, cricket, hockey, golf or "squash" racquets to take one's thoughts off work for an hour or two, and to freshen up body and mind; nothing but a little tennis or swimming in summer, and skating or fencing in winter.

Passing Out.—Examinations are held at the end of each year, as follows :—

At the end of the first year, in tactics, strategy, military history, military engineering, artillery, and small arms.

At the end of the second year, in the above subjects, less artillery and small arms.

At the end of the third year, in military history and staff duties. There are also examinations in the voluntary subjects.

After the final examination and the three weeks' staff ride, the Commandant, assisted by the Studies Committee, draws up the final report, and makes out certificates for each candidate. The report and certificates are based on the general work done by the student at the college, the results of the written examinations, of *vivâ voce* examinations or questions, of the final staff ride and other outdoor work, his work with units of other arms, his general ability, character and conduct.

The report, which is confidential and is not communicated to the officers concerned, classifies the students under the following heads :—

- (1) Fit for the General Staff.
- (2) Fit for the technical division of the General Staff (Survey, &c.).
- (3) Fit for administrative staff work (*Adjutantur*).
- (4) Fit for employment as instructors.
- (5) Unfit for staff employment.

An officer may be classified under several headings ; (1) is understood always to include (3).

Each student receives a certificate showing his proficiency in the various subjects.

On the conclusion of the course, *i.e.*, at the end of September, officers rejoin their own units, and usually receive a few weeks' leave to rest from their labours. On the 1st March of the following year, those who have been recommended for (1) are ordered to join the Great General Staff in Berlin on probation for one year. At the end of this probationary period some are sent back to their units, some to join the staffs of army corps, divisions, &c., whilst some remain in the Great General Staff. No appointments on the General Staff are made until officers have spent a year on probation attached to the Great General Staff at Berlin. Special advantages and rewards are given to staff college graduates, particularly those appointed to the General Staff, who get accelerated promotion as a matter of course.

The Bavarian Staff College.

This college is similar to the Prussian establishment, but on a smaller scale. Its Commandant or Director is a colonel ; he is assisted by an adjutant, with a staff of 5 regular military and 2 civilian professors, in addition to occasional lecturers and instructors.

APPENDIX I.

RECENT PUBLICATIONS OF MILITARY INTEREST.

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REVIEWS OF BOOKS.

ARTILLERY.

The Artillery at the manœuvres in Picardy in 1910. (*L'Artillerie aux manœuvres de Picardie en 1910.*) By General Percin, late Inspector-General of the French Artillery. 252 pp. 8vo. Paris, 1911. Berger-Levrault. 6s. 3d.

Although this book is entitled "The Manœuvres of Picardy," it is not so much an account of the manœuvres as a presentment of General Percin's views on the employment of artillery in the field, illustrated by the events at the manœuvres. These views are entitled to great respect on account of the author's high reputation as a tactician.

The present book deals exclusively with the combined action of infantry and artillery. Although two cavalry divisions, besides the army corps cavalry, were present at the manœuvres, but slight mention is made of their operations. Possibly General Percin intends to treat this branch of the subject in a future book.

The general theory of the employment of artillery, as now accepted in the French Army, is based on the principle of keeping a reserve in hand, which enables the superior commander to intervene at any point in order to complete a victory or to avert a defeat. The Army Corps commander has at the outset twelve batteries in hand. When any special "task," such as the attack on a position, has to be carried out, the Army Corps commander details part of his force (for instance, one division) to execute it. If necessary, he reinforces this force with part of corps artillery. When the task is completed, the general officer commanding artillery withdraws the batteries lent to the division. Various tasks may present themselves, each calling for the issue of batteries from the corps artillery; but the general officer commanding artillery must manage to withdraw other batteries as soon as they have served their purpose, so as, if possible, always to keep a floating balance ("*masse économique*") of batteries in hand. The same applies to the division; the general officer commanding division orders an infantry brigade to attack a village, and gives it a certain number of batteries from his divisional artillery; as soon as the village is taken, the artillery commander of the division withdraws the batteries, and these then go to maintain the floating balance of divisional artillery. Similarly, the brigadier may tell off a battalion and a battery for a minor task.

A most important regulation, which has now been in force for two years, lays down that each force of artillery and infantry detailed to execute a given task is to be under the command of the senior infantry officer. This officer does not merely consult with the senior artillery officer; he gives him his orders as to where to place his batteries, what to fire at, and when to open fire. Similarly, when an artillery group is sent up to reinforce an infantry brigade, the group commander reports to the brigadier for orders, and is usually told to establish tactical connection ("liaison") with the commander of a certain infantry unit, and to take his instructions from him, sending an officer ("agent de liaison") with the infantry to keep up communication. Further, when an artillery commander finds himself in presence of an offensive or defensive infantry operation as to which he has received no orders, he must at once place himself at the disposal of the infantry commander. "*C'est l'infanterie qui mène le combat,*" and artillery must always be content to play a subordinate part. They are on no account to attempt to conduct a combat of their own. Neither must they be merely independent spectators of the infantry combat, putting in their fire where they think it likely to assist the infantry. They must work in intimate combination with the infantry, and under the orders of the infantry commander.

General Percin lays special stress on the subordination of artillery to infantry, as some artillery officers are still reluctant to give up their independence of action. He gives numerous instances from the manoeuvres in which this principle was violated or imperfectly carried out. In almost every one of these cases the result was that the artillery either fired on the wrong target or on their own troops.

In only one case was the experiment tried of handing over the whole of the artillery of a defensive position to the divisional artillery commander, in order to secure concerted action of the artillery along the whole line. The result was a failure. Although the batteries occupied a front of only 3,850 yards, the commander of the divisional artillery was unable to direct their fire, and finally had to hand them over to the infantry commanders of sections of the defence.

On three occasions, groups and batteries ("batteries d'accompagnement") were sent forward with attacking infantry. Little is said about their performance, and it seems that on each occasion the manoeuvres ceased for the day before they got to close quarters. The employment of these advanced batteries was the less necessary that the artillery worked throughout at short ranges, rarely exceeding 2,750 yards.

General Percin holds that batteries withdrawn from infantry units on completion of their tasks should not be sent to the rear and formed up as a reserve. If in concealed positions, they should remain where they are until required; if not, they should get under cover.

A point on which the General lays special stress is that of single orders ("l'ordre unique"). Operation orders, both before and during the battle, must include the orders both for infantry and artillery, so that each infantry unit knows which artillery unit is to support it, and where

it is to be found, and *vice versa*. The orders issued to each arm are to be completed by the supplementary orders applicable to that arm alone.

In his concluding remarks, General Percin discusses a number of minor questions, such as the employment of oblique fire. The whole book constitutes a most valuable treatise on the combined action of infantry and artillery, and the author's demonstrations of the principles involved are so clear and logical that it is difficult to disagree with him on any essential point.

Field artillery matériel with an extended field of fire. (Matériel d'artillerie de campagne à grand champs de tir.) By Lt.-Col. Deport. 34 pp. and 6 photographs. 8vo. Paris, 1911. Berger-Levrault. 1s.

Colonel Deport, late of the French Artillery, was one of the committee who designed the French service field gun, and is well known as an artillery scientist.

In the present pamphlet he describes a new type of field gun, specially designed to fulfil modern tactical requirements. While possessing all the qualities of the ordinary quick-firer type, it has the additional advantage of possessing a horizontal field of fire of 54 degrees, and a vertical field up to 70 degrees of elevation. When engaging a fresh target with the ordinary field gun, beyond the limits of 3 degrees traverse either way afforded by the carriage, it is not only necessary to shift the trail, but also the wagon alongside the gun, which entails considerable delay. With the Deport gun, practically any target in sight can be engaged at a moment's notice. On the defensive, when guns are in position ready to repel an attack, it is rare that the exact direction from which this attack is delivered can be determined till the last moment, and the delay caused by shifting the trail and wagon is then particularly undesirable.

Many cases occur in which the enemy, behind gun-shields or parapets, are safe from the fire of ordinary field guns, but the Deport gun, with an angle of descent of 70 degrees, is capable of searching any cover likely to be met with in the field.

The large field of fire of the Deport gun is obtained by the use of a split or "scissors" trail, and of a special form of recoil gear.

The trail is in two halves, turning about vertical pivots on the carriage. The two halves are brought together for travelling, and opened out widely for firing. The point of each half is then nailed to the ground with a stout steel spike driven down by a hammer. This method of anchoring is already in use in the present French mountain gun. It is stated that the spikes hold well on all natures of ground, and are lighter than the spade.

The recoil gear is compound and consists of an upper and a lower cradle with buffers and springs. The upper carriage recoils 40 inches on the lower cradle, and the gun recoils 15 inches on the upper carriage. The lower cradle is always approximately horizontal, being inclined only for the angle of sight, while the upper cradle can be elevated up to

70 degrees. Thus at high elevations the downward displacement of the gun on recoil is within the limits afforded by the height of the carriage, so that the breech does not strike the ground.

The gun is a 14·3-pr. of 75 mm. calibre, with muzzle velocity of 1,675 fs. It has the eccentric screw breech action, fitted with semi-automatic gear which throws open the breech and ejects the empty cartridge case during recoil. It has the independent line of sight and is efficiently shielded. It weighs 20·4 cwts. in action; the height of wheel is not stated. The rate of fire varies from 26 rounds a minute point-blank to 19 at high elevations.

The Deport gun was successfully tried by the Italian Government in 1909–1910, the travelling and firing trials extending over five months, during which the gun travelled 600 miles and fired 1,995 rounds.

Colonel Deport proposes shortly to bring out a gun on this system equal in power to the French service gun, namely a 16-pr. with muzzle velocity of 1,740 feet per second.

German and French Artillery. A comparison. (Artilleries allemande et française.) By Lt.-Col. Beyel of the French Artillery. 8vo. Paris, 1911. Berger-Levrault. 1s. 8d.

This pamphlet is a reprint of a lecture delivered by Colonel Beyel in 1909. It is a comparison of the French and German field artillery as regards matériel, fire-discipline, and tactics.

The French gun is a far more powerful weapon than the German gun, the muzzle energy being as 102 to 76, and the dangerous zone of the shrapnel bullets at medium ranges being one-third greater. Owing to the compressed air gear and to the system of traversing on the axle, the French gun is much the steadier; and owing to the use of the eccentric screw breech action, its rate of fire is greater in the proportion of 5 to 3. It would appear, however, that this comparison refers to the separate ammunition formerly used with the German gun, which is now superseded by fixed ammunition. The weight of the French gun in action is given as 22·4 cwts. against 19·3 for the German; but the French gun, with 3 gunners, weighs practically the same behind the team as the German gun with its 5 gunners, namely 43·2 cwts. The German gun has the more efficient shield, but it is proposed to fit the French gun with a larger shield at an early date.

The French battery has 4 guns, 12 wagons, and 6 other carriages; it has 3 officers, 171 men and 168 horses. The German battery has 6 guns, 6 wagons and 5 other carriages; it has 5 officers, 152 men, and 134 horses. The author might have noted that the German battery has also 7 wagons as its share of the *Abteilung* ammunition column.

The comparison between French and German methods of fire-discipline refers to the 1907 German regulations, which have since been superseded. However, the author's remarks on the clumsiness of the German method of adjusting the fuze by shifting the trajectory are still applicable.

The section on tactics is devoted to showing that each successive edition of the German regulations has been copied from the French regulations which preceded it, so that the Germans are always behind-hand. The Germans still cling to the idea of the artillery as a separate arm, whose fire is directed by the artillery commander of the army corps or division, whereas the French now hold that the infantry commander entrusted with the actual execution of an offensive or defensive operation must have a sufficient number of batteries handed over to him, and must be the sole commander of both arms. One result of this difference of views is that the German army is much better equipped with long-distance means of communication, such as telephones and field wireless stations, than the French army. But the author considers that the experience of the Japanese in Manchuria tends to show that this network of telephone cables is far from reliable.

Transport of mountain and machine guns on ordinary skis. (Transport von Gebirgsgeschützen auf gewöhnlichen Skiern.) By Captain Czánt, Austro-Hungarian Army. 83 pp. 41 photos. and sketches. 8vo. Vienna, 1911. Seidel und Sohn. 3s.

Considerable attention has been devoted of late years to the value of ski-ing for military purposes both in Germany, Italy and Austria. In the latter country there are computed to be from 20,000 to 25,000 soldiers who are expert ski runners, and some 10,000 pairs of skis made at a military factory are held on military charge. The little book under review is a panegyric on ski-ing written by an enthusiast. After dealing generally with the subject of military ski-ing, the author gives a useful description of various methods by which mountain and machine guns can be carried by means of skis. The information is very clearly given, and the sketches and illustrations are excellent.

FORTIFICATION AND MILITARY ENGINEERING.

Instructions for the use of telegraphs and telephones with the army in the field. (Telegrapheninstruktion für die Armee im Felde.) Official. 79 pp., 4 plates. 8vo. Vienna, 1911. Seidel. 8d.

Following on the recent reorganization of the Telegraph Regiment, a new manual, "Telegrapheninstruktion für die Armee im Felde," has been issued. The means of telegraphic, telephonic, and signalling communication in possession of the various units of the field army in war are to be as follows :—

Company of infantry	1 telephone station with 1,640 yards of wire. 4 flag stations. 2 lamp stations.
Battery of artillery ...	3 telephone stations with $5\frac{1}{2}$ miles of wire. 5 flag stations. 1 lamp station.
Mountain battery ...	2 telephone stations with $3\frac{3}{4}$ miles of wire. 3 flag stations. 1 lamp station.

Fortress	artillery	6 telephone stations with $7\frac{1}{2}$ miles of wire.
battery		6 flag stations.
		1 lamp station.
Pioneer company	...	2 telephone stations with $1\frac{1}{2}$ miles of wire.
Railway company	...	5 telephone stations with $6\frac{1}{4}$ miles of wire.
Squadron		4 flag stations.
		4 lamp stations.
Cavalry regiment	...	4 telephone stations with $12\frac{1}{2}$ miles of wire.
		2 long-distance optical stations.
Commander-in-Chief's		1 telegraph unit with 8 stations and 50
headquarters		miles of wire.
Army headquarters	...	2 telegraph units each with 8 stations and
		50 miles of wire.
		1 special telegraph unit with $2\frac{1}{2}$ miles
		submarine cable and 25 miles of wire.
Army corps		2 telephone units, each with 8 stations and
		50 miles of wire.
		1 telegraph unit with 8 stations and 50
		miles of wire.
Infantry division	...	1 telephone unit with 4 signal, 4 telephone
		stations, and 25 miles of wire.
Mountain division	...	1 pack telephone unit with 4 signal, 4
		telephone stations, and 25 miles of wire.
		1 pack telegraph unit with 6 telegraph
		stations, and 25 miles of wire.
Mountain brigade	...	1 pack telephone unit with 6 signal, 6
		telephone stations, and 25 miles of wire.

The telegraph and telephone units of the larger formations (mountain brigade and upwards) are manned by the telegraph regiment.

Smaller formations (cavalry regiment and downwards) find their own personnel for telephone and signal work.

Mobile wireless stations will be distributed according to circumstances.

Behind the field armies there will be reserve telegraph construction units, and reserve telegraph communication units. The personnel is provided by the civilian State telegraph department. These units will be distributed in rear of the various armies, and on the lines of communication, as required.

Behind the reserve telegraph units, telegraph dépôts of men and stores will be formed. The personnel will include men of the telegraph regiment and civilians of the State telegraph department.

The manual deals in detail with the composition and organization of the various units above referred to, and their employment in war. It also contains a chapter on the organization of the communication units allotted to fortresses. It is pointed out in the preface, that officers of all arms are expected to make themselves acquainted with the principles laid down.

Handbook of explosives and their employment in war. (Handbuch der militärischen Sprengtechnik.) By Captain Zschokke of the Austro-Hungarian Engineer Staff. 400 pp., 299 illustrations and 5 plates. 8vo. Leipzig, 1911. Veit. 14s.

This book deals with explosives and their employment for military purposes in a concise, but at the same time, comprehensive manner. The various chapters deal with :—

- (a) Materials.
- (b) Means of ignition.
- (c) General theory of employment of explosives.
- (d) Mining operations.
- (e) Ground mines and fougasses.
- (f) Demolitions of earthworks and rocks, and of constructions of masonry, wood and iron.

A very large amount of information taken from many sources, old and new, is here presented in a way that is both instructive and practical. A good account of the mining operations in the Crimea is given, and the description of the attack on Port Arthur is of considerable interest. The book is concise and well arranged, with clear and numerous explanatory diagrams.

HISTORY.

The Russian Cavalry in Manchuria. (La Cavalerie Russe en Manchourie.) By Captain Boullaire. 54 pp. and 3 maps. Paris and Nancy, 1911. Berger-Levrault. 1s. 9d.

In two series of more or less detailed descriptions of the operations of the Russian cavalry in the Russo-Japanese War the author shows how the Russian cavalry commanders, operating under the conditions which obtained in Manchuria, generally speaking, turned them to their own advantage, but in some cases failed to do so.

These conditions were as follows : Firstly, the physical features and climate in the theatre of operations were such as would seriously reduce the mobility of any cavalry ; secondly, the cavalry on either side were not highly trained and the Russian cavalry units were not accustomed to work in co-operation ; thirdly, the Japanese cavalry systematically refused to encounter its rival.

The last 6 pages of the pamphlet are devoted to a theoretical study of the " combat à pied " of a cavalry regiment.

The Armies of India. Painted by Major A. C. Lovett ; text by Major G. F. MacMunn. 220 pp., 72 paintings, 19 drawings and index. 8vo. London, 1911. Adam and Charles Black. 20s.

This book, to which Lord Roberts contributes a foreword, is admirably illustrated with characteristic types of all the fighting classes now enlisted in the armies of India ; it will be found readable and instructive by every officer who has served in India, and by all who are interested in that part of the Empire.

The subject is dealt with as follows :—

Chapter I traces the history of the Indian Army from its inception to the Mutiny.

Chapter II recounts the salient features of the two Mahratta Wars of 1803–06, which, in addition to their interest as military operations, have a great bearing on the political development of the India of to-day and on the evolution of the Indian Army.

Chapter III outlines the gradual decay of the old Bengal Army, the side currents that led up to the Mutiny, and the general trend of events during that crisis.

Chapter IV deals with the Indian Army under the Crown subsequent to the Mutiny.

Chapter V gives a short description of the various military races of India.

Chapter VI shows the constitution of the Indian Army in 1911.

Chapter VII sketches the origin, constitution, and system of the “Imperial Service Troops” and their political relation to the Government of India.

Chapter VIII shortly describes the Frontier Militia, the Military Police and Levy Corps, and concludes with some reflections on our military position in India.

The book is pithy, and the salient points are well brought out unobscured by detail. Mention is made of the origin of and part played by many individual corps, of the uniforms of various periods, of the medals and honours won, and of the long sequence of campaigns in which the Indian Army has taken part. The grouping of the army by class and clan, the diverse questions of organization, and the controversial points of principle connected with its evolution, are succinctly described and explained. Attention is called to the Imperial rôle so often played by the armies of India, to their strategic position in the Empire, and to the lesson to be learnt from the short-sighted policy of reduction carried out in 1882.

With the Lost Legion in New Zealand. By Colonel G. Hamilton-Browne (“Maori Browne”). 397 pp., including index. 12 illustrations. 8vo. London, 1911. Werner Laurie. 12s. 6d.

The wars which began in New Zealand in 1845, and continued at intervals almost up to 1870, are not widely known, nor are they generally deeply studied by soldiers; which is a pity, for the struggles were not without their lessons. Moreover, the history furnishes many examples of the chivalry of a brave race as well as of the gallantry of the British soldier.

Colonel Browne’s book deals only with events subsequent to 1865, as it was early in 1866 that he joined a colonial corps and became what he is pleased to call one of “the Lost Legion.” The work is not sufficiently detailed to facilitate close study, but it serves two useful purposes: firstly, it gives a good general idea of the part played by the locally raised forces in the pacification of the country; and, secondly, the

manner in which the book is written is essentially "human," and well exemplifies the spirit in which the war was waged.

Napoleon I. By August Fournier, translated by Miss Adams. 2 vols., each 565 pp., 2 maps, an index and bibliography. 8vo. London, 1911. Longmans. 21s.

Dr. Fournier's life of Napoleon was first published in 1885; owing to its success a revised edition was issued in 1904, from which the present translation has been made.

Dr. Fournier has made no attempt at a detailed study of Napoleon's career from the strictly military point of view, but as a general history of the Emperor's life the book is accurate, valuable, and interesting.

The Germans in the American Civil War. (*Die Deutschen im Amerikanischen Bürgerkriege.*) By Wilhelm Kaufmann. 558 pp., with 36 maps and plans. 8vo. Berlin, 1911. R. Oldenbourg. 8s.

This is an attempt to provide for German readers a history of the part taken by the German-Americans in the War of Secession. It contains a general account of the war in the two main theatres, compiled chiefly from reports, letters, &c., of German officers and soldiers, so that special stress is laid on the action of German commanders and units. It does not deal with the naval warfare, blockade, or minor campaigns like the Red River Expedition and the fighting in the Carolinas. It concludes with 120 pages of biographical notices of some 500 "most prominent" German officers. Nearly all of these fought on the Union side. Few of their names are known to ordinary students of the war, except those of Sigel, Schurz, Von Steinwehr and Blenker. The first three of these and six others: Osterhaus, Willich, Stahel, Weitzel, Kautz, and F. Salomon reached the rank of major-general; and Sigel, Osterhaus, and Weitzel commanded army corps. The last named, however, was brought to America as a child and was educated at West Point.

It may be remarked here that the biographies reveal that the author includes Austrians, Swiss, and even Hungarians in the term "German." He claims, on page iii, that 216,000 "German-born" men fought in the Union armies. The total number of Union soldiers is given by Dr. Gould in his "Investigations in the military and anthropological statistics of American soldiers" as 2,018,200. He reckons that there were:—American born, 1,523,267; Canadians, 53,532; English and Scotch, 45,508; Irish, 144,221; Germans, 176,817; other foreigners, 74,855. On page 134 Herr Kaufmann further claims that "every third man in the Federal Army was of German blood."

Of the 216,000 "German born" soldiers, about 36,000 served in wholly German regiments and batteries, in which German words of command were generally used, under German officers. The remaining 180,000 joined ordinary regiments, but often formed German companies and sometimes battalions. These national units, however, were too small in number to be specially noticeable. Only one German division

was formed, that of Blenker in the Army of the Potomac; Missouri produced a German brigade which existed throughout the war; but no other higher unit was formed, unless the 2nd Brigade of the 3rd Division of the 20th Corps is counted. This consisted of two German and two half-German regiments, with German artillery.

The German division had only a short existence. It was formed during McClellan's organization of the Union Army in the winter of 1861-62. Under Blenker, who was an ex-Bavarian non-commissioned officer, it became celebrated for its turn out and smartness at drill, to which McClellan himself has borne witness in his memoirs. In March, 1862, it marched out with some difficulty to Warrenton, and whilst there was ordered to Romney (the scene of Stonewall Jackson's exploit) to join Frémont. As is well known it was unable to reach its destination, getting no further than Winchester, and was "lost" for several weeks, Frémont being sent eventually to look for it. Bad weather, indifferent roads, and short rations made quick work of barrack square discipline; the division took to plundering, and was finished off by a whiskey factory at Paris. To translate the author's words "The men indulged in the fresh made alcohol in the most imprudent (*unverständigster*) manner. Who can blame the poor fellows wanting to warm themselves? Suffering from hunger and exhaustion, the soldiers had now in addition to endure the results of immoderate indulgence in alcohol."

By May, 1862, when the division was called on to take part in the unsuccessful chase of Stonewall Jackson in the Valley, its numbers had fallen from 10,000 to 6,000, without having been in action. After the battle of Cross Keys, where one brigade was up in time to make an unsupported and unsuccessful attack, Blenker was recalled to Washington, and the division was broken up, the three brigades being distributed to the three divisions of Sigel's First Corps, which later on was renumbered the Eleventh Corps.

Herr Kaufmann is at pains to clear the Eleventh Corps of the charges of unreadiness and cowardice which popular opinion made against it after its surprise by Stonewall Jackson at Chancellorsville. He says, as is now generally admitted, that the Government unjustly allowed it to be made a scapegoat. Two of its three divisional commanders (Schurz and Von Steinwehr) and many of its brigade and regimental commanders were Germans, and he states that of the 8,500 men actually present, 4,600 were Germans. He adds that the corps commander, General O. O. Howard, "an apostle of temperance . . . who knew more about the Bible than the art of war, was not a sympathetic personality to the German part of the Eleventh Corps."

It is very justly pointed out that the Union Government did not make the use it might have done of the trained German officers who joined the army; it preferred to give high command to politicians like Schurz and mountebanks like Blenker, over the heads of experienced soldiers like Von Steinwehr and Schimmelfennig.

The names of 31 Germans who served as officers in the Confederate army are given; of these the only well known ones are Von Borcke, a

cavalry officer who served as staff officer with Stuart; his sword hangs in the capitol at Richmond; Scheibert, a major of engineers who served on Lee's staff, and wrote an excellent history of the Civil War; and the unfortunate Wirz, a Swiss doctor, superintendent of Andersonville Prison.

The Revolutionary War of the United States. By Major-General F. V. Greene (United States Army). 350 pp., with numerous maps. 8vo. London, 1911. John Murray. 15s.

General Greene has done what could only be possible to a very thorough student of this eight years' war: he has produced a perfectly clear, soldierly, and, one is almost justified in saying, complete account of it, within 281 pages. The 63 excellent maps and plans, marked with the positions and routes of the two armies are a very material aid to the condensation of the narrative. The author bases his history on the very best authorities, and is conspicuously fair in statements. There is nothing to offend the British reader's susceptibilities, although he somewhat slurs over the gross breach of faith committed by Congress in not carrying out the terms of Burgoyne's surrender: that his troops should be permitted to return to England. He admits that "as a matter of fact they were never sent to England," and adds "it was an unseemly controversy, and many of the positions taken by Congress were not tenable."

He makes it perfectly clear that the proof that Major André—"the unfortunate André," as he calls him—was a spy, was incontrovertible. The board of 14 Generals who tried him found that "under a feigned name and in a disguised habit he passed our works . . . and that when taken he had in his possession several papers which contain intelligence of the enemy." Even to-day on such evidence a Military Court would give the same verdict.

The last 50 pages are taken up with an account of "The military policy of the United States," in which the necessity of a definite policy to meet existing conditions is argued, and the dangers of unpreparedness are exposed. General Greene concludes "we are about as unprepared now as at any previous time."

The First American Civil War, 1775-1778. By the Reverend H. Belcher. 2 vols. 8vo. 350 and 354 pp., with portraits and plans. London, 1911. Macmillan. 21s.

This book deals with the commencement of the American Revolution. It describes, from the standpoint of a strong British partisan, the local and material conditions of the time and the moral and social background of the struggle rather than the war. It ends abruptly at Burgoyne's surrender at Saratoga.

The writer speaks of the military operations as "dull and stupid," and considers that "the military interest of the Civil War is of the slightest."

The author has had access to the papers of General Gage. The

views he expresses differ considerably from those of Sir George Trevelyan in his "American Revolution."

Retrospects. (Regards en arrière.) (L'état-Major.) By Leon Hennet 299 pp. 8vo. Paris, 1911. Chapelot. 5s.

The author has written a number of books dealing with the period of the French Revolution, and, in the present volume, he describes the organization and work of the French Staff at that time. He explains that in those days the Staff were hopelessly incapable of carrying out the duties required of them; this is not surprising when we learn that officers were only appointed to the Staff on the outbreak of war and owed their appointments entirely to favouritism. Most staff officers were absolutely wanting in experience, and matters appear to have reached a climax during the War of the Austrian Succession and the Seven Years' War when Staff work was given over to young officers straight from school. Subsequently, the idea of establishing a permanent cadre of staff officers was conceived, and in 1766 the foundation of a regular staff was laid by Lieutenant-General Bourcet, who formed a kind of Staff College where officers underwent courses of practical instruction. But the experiment was only shortlived, and in 1771 was abandoned from motives of economy. Twelve years later, however, a cadre of staff officers was once more formed by the Marquis d'Aguesseau, in accordance with the ideas and methods of General Bourcet. The Staff thus constituted did excellent work, and numbered among its members such men as Dumas, Gouvion, Menou, Meusnier, Montrichard, César, and Alexandre Berthier. Monsieur Hennet has collected a large number of documents to support the statements contained in his book, and has given a complete list of the officers employed on the Staff at the period of which he writes, together with notes on the career of each officer.

The book will doubtless be of considerable interest to historians, but it is doubtful whether the ordinary British officer will get much benefit from it.

In the Shawia Country. (À travers la Chaouia.) By Captain Grasset, 118th Infantry Regiment. 224 pp., with 2 maps and 46 photographs. Paris, 1911. Hachette. 3s. 6d.

The north-western boundary of the Shawia country follows the Atlantic coast for a distance of about 50 miles on either side of Casablanca, whilst its south-eastern limit may be roughly taken as a line drawn some 75 miles inland and generally parallel with the coast. A portion of this country was the scene of the operations undertaken by the French against the Moors in 1907-1908, and it is to an account of these operations that this book is mainly devoted. It is dedicated to General d'Amade who commanded the French troops after the recall of General Drude in January, 1908, and gives a very clear and interesting account of the campaign, to which some excellent photographs are added. The most valuable part of the book, however, is that in which the

armament and tactics of the Moors are described, and in which comments are made on the equipment and tactical methods of the French troops.

As regards armament the author tells us that the Moors were all armed with small calibre rifles such as Martini-Henrys, Winchesters, Mausers, Wetterlis, Remingtons, &c., and that they had large quantities of ammunition but no bayonets. Fortunately, however, for the French, the use of the backsight was not understood by the Moors whose fire was almost invariably high. It appears also that the force under Mouley Rechid, which came to the assistance of the Moors towards the end of 1907, possessed three or four Canet and Krupp guns which, again luckily for the French, were not properly used owing to the inability of the Moors to set the fuzes. Most of the Moors were mounted, and it was on horseback that they preferred to fight. When the approach of a French column was signalled, the mounted men would ride out to meet it, and if the distance were not great, each man carried an infantryman behind him; as a rule, however, the foot soldiers lay in ambush waiting for an opportunity to fire on the enemy, or remained in camp ready to strike the tents and move off if the mounted men were defeated. The general principle underlying the attacks of the Moors was to hold the enemy in front and then envelop his flanks. Their tactics were entirely offensive, and they seemed to have no idea whatever of making use of ground for defensive purposes. The French were surprised to find that when they had to traverse particularly difficult country which offered admirable opportunities to the Moors, the latter made no sort of resistance until the dangerous zone had been passed by the French troops.

The French experience of the tactics of the Moors coincides in some respects with that of British troops operating against the tribesmen on the north-west frontier of India. For example, whenever a French column began to retreat or showed the slightest sign of hesitation, it was at once furiously attacked. The French, indeed, discovered that the only way to deal successfully with the Moors was to adopt a vigorous offensive at all times.

As regards the armament and equipment of the French troops: the Lebel rifle appears to have given every satisfaction, but Captain Grasset thinks the present bayonet useless. It was found to bend, and the wounds inflicted by it, though causing internal hæmorrhage, had no stopping effect. It is suggested that a shorter and stouter bayonet should be adopted. The 75 millimetre gun is spoken of in the highest terms; its effect is described as magnificent, and in spite of its weight, it was always possible to bring the gun up in time to co-operate with the infantry. Two types of machine guns were tried during the greater part of the campaign, namely, the Hotchkiss and the Puteaux. Both are favourably reported on, but the Puteaux is said to be the better of the two because there were fewer "jams" with it, and also because it has an arrangement by which the rapidity of fire can be regulated. Towards the end of the campaign four sections of "galloping machine guns" belonging to cavalry regiments were sent out from France, but they were so little used that no opinion of their value could be formed.

As regards the formations adopted by the French, the square formation was tried during the earlier part of the operations but was found to be inelastic, and to lead to heavy losses from rifle fire. On the arrival of General d'Amade, it was abandoned in favour of a skirmishing formation at 3 or 4 paces interval which was found very suitable. In the appendices to the book there is an account of the history, climate, &c., of the Shawia country; tables are also given showing the losses sustained by the French, from which it appears that throughout the operations, 11 officers and 86 men were killed, and 17 officers and 377 men wounded, out of a total of 9,000 men.

The book is well worth reading.

The War of 1870-71. National Defence in the Provinces. (La Guerre de 1870-71. La défense nationale en Province.) Published by the *Revue d'histoire*; edited by the Historical Section of the French General Staff. 2 vols., 670 and 707 pp. 8vo. Paris, 1911. Price for the 2 vols., 15s. 10d.

These volumes are the latest instalment of the history of the war of 1870-71 which is being produced by the French General Staff.

It will be remembered that early in September, 1870, the Government of National Defence, realizing that Paris would soon be cut off from the outer world, established a government of delegates at Tours for the purpose of dealing with the administration and defence of the Provinces. The task which faced this government was indeed a stupendous one. The army of the Rhine was shut up in Metz, whilst the army of Chalons had surrendered at Sedan, and there were no organized bodies of regular troops in the field. Most of the available resources of the country in men and material were accumulated in Paris, where it was recognized the fate of the country must finally be decided. The Provinces had therefore to struggle, unaided, for their existence. There was, it is true, no lack of the fighting spirit among the population; on the contrary everyone was ready to take his place in the ranks. The efforts made in the Provinces had, however, been too disjointed and too local to produce any appreciable results. Individual enterprise was quite useless in the circumstances, and the only hope lay in the possibility of producing fresh armies to meet the victorious Prussians. Gambetta and the government of delegates, in no way dismayed however, set to work with extraordinary energy, and in a few weeks had created a semblance of order out of complete chaos. By abolishing every sort of exemption from military service the dépôts were filled with men; the remnants of the regular army were amalgamated with the auxiliary forces and formed into organized bodies; and in order to obtain officers and non-commissioned officers all existing laws regarding appointments and promotions were suspended. Equal energy was shown in providing the necessary arms and equipment. National and private factories vied with one another in the construction of war material; advantage was taken of the impotence of the German fleet, and munitions of war of every kind were obtained from abroad. No sacrifice or expense was, in fact, spared by the government in its endeavours to retrieve the situation, with the

striking result that during the period from the 15th September to the end of the war it was able to place in the field no less than 10 army corps complete with every requisite of war.

Why was it that all this magnificent work of the government and all the splendid patriotism and bravery of the French nation were in vain? The reply of the French General Staff to this question is to be found in the following quotations from this book.

"The willingness and courage of the improvised officers left nothing to be desired, but, unfortunately, their general want of experience and their lack of professional education and of authority over their subordinates was often only too apparent."

"It cannot be too often repeated that an army cannot be improvised. At first the ranks of the new formations were filled up with old soldiers who were capable of meeting the enemy on something like equal terms, but, when the supply of old soldiers became exhausted, the results were at once apparent, and it may be said that, in spite of all efforts to instruct them, the men in the newly raised units certainly knew how to die but were not soldiers."

These volumes present a terrible object lesson of the results of unpreparedness for war, and it is to be hoped that they will be read by all who still believe that it is possible for improvised bodies of troops to face regular soldiers with success in the field.

The Military Life of Marshal Ney. (*La vie militaire du Maréchal Ney.*) By General Bonnal. 508 pp., and 18 maps. 8vo. Paris, 1911. Chapelot. 14s.

This is the second volume of General Bonnal's "Military Life of Marshal Ney," and deals with the period from 25th March, 1802, to 18th July, 1807. It will be remembered that the Treaty of Amiens was signed on the 25th March, 1802, at which time Napoleon had collected some 50,000 men, and a large number of transports at certain ports, with the object of attempting the invasion of England. In April, 1803, war broke out again, and in June of that year Napoleon formed "camps of instruction" at Utrecht, Ghent, Saint-Omer, Compiègne, Brest, and Bayonne. Each of these camps accommodated from 20,000 to 30,000 men, and the camp at Compiègne was assigned to Marshal Ney; but, during his absence in Switzerland, was commanded by Soult. Before Ney's return, however, the troops at Compiègne were moved to Montreuil on the coast, where, on the 4th March, 1804, he took over his command, and at once began to devote himself with great energy to the training of his troops. The details of this training, which included practice in embarking and disembarking troops, guns, stores, and transport, are decidedly interesting. Special attention must, however, be drawn to certain documents entitled "Instructions pour les troupes du corps de gauche" which were issued by Ney to the troops at Montreuil camp. These Instructions ordered the carrying out of a course of training founded on the linear tactics and evolutions of Frederick the Great as practised at Potsdam camp, with modifications

based on the experience gained during the wars of the Revolution. One section of these Instructions is headed "Some Reflections on the Movements of Infantry," and contains much interesting matter, a good deal of which is applicable at the present day. Ney laid special stress on the training of infantry in moving at the double. His views on this subject were, however, not concurred in by other French commanders, and General Bonnal remarks that a proof of the conservatism of the French Army is furnished by the fact that, although the Prussian infantry showed themselves in the battles of August, 1870, to be adepts in movements at the double, these movements were not practised by the French infantry until 1904.

On 26th August, 1805, the various detachments which had been stationed at the camps of instruction in Holland, Belgium, and France became the "Grand Army," the command of the 6th Corps of which was given to Ney. A few days later the Grand Army was ordered to move to various points on the Rhine in order to deal with the armies of Austria and Russia, Ney's corps being ordered to march to Schlestadt. Ney's march orders are given verbatim, and interesting comments are made by General Bonnal on nearly every one of the 35 paragraphs of which they consist.

During the march of the Grand Army to the Rhine there were several cases of friction between Napoleon's marshals, some of which were due to want of clearness in the orders issued by Berthier. Things at one time came to such a pass that Murat remonstrated with Napoleon regarding his method of issuing orders, and asked that the corps commanders should be informed of the positions of the various portions of the Grand Army and the duties assigned to each, adding, "How can one protect oneself when one does not know the position and direction of the corps which are in front, behind, or on the flanks?" Serious trouble occurred between Ney and Murat on two occasions during the operations leading up to the capitulation of Ulm for which the vagueness of Berthier's orders was to some extent responsible, though it must be admitted that Ney did not attempt to understand the instructions he had received, and was exceedingly insubordinate. Indeed, on 11th October, at Gunzburg, he went so far as to challenge Murat to fight a duel whilst an action was actually in progress. On the occasion in question Murat had been placed in command of the French right wing, which included Ney's corps, but apparently Ney did not, or would not, understand the extent to which he was under Murat's orders. It was obviously necessary to prevent the Austrians from breaking out of Ulm to the north, and, consequently, a French force had to be kept on the left bank of the Danube. Murat thought that a small observing force would be sufficient, and that the remainder of the right wing should be brought to the right bank of the river. Ney disagreed with this, considering that Dupont's division at least should remain on the left bank, and when Murat refused to accept his suggestion, he became very violent and made the insubordinate challenge mentioned above. After events proved that Ney's view

of the situation was quite right, but of course nothing could justify Ney's action; General Bonnal, however, attempts to defend his hero and severely criticizes Murat, of whom he says that "he owed his high command more to his being the husband of a Bonaparte (the Princess Caroline) than to his personal worth." Ney's conduct, however, on the 11th as well as on the 12th and 13th October brought him a severe rebuke from the Emperor, which cannot be said to have been undeserved, although General Bonnal insinuates that the Emperor's mind was poisoned by Murat's misrepresentations. But the Emperor's displeasure did not apparently last long, for he bestowed the highest praise on Ney and his corps for their gallantry at Elchingen Bridge on the 14th October.

General Bonnal makes some interesting comments on the Ulm campaign, and is evidently of opinion that Napoleon enjoyed a certain amount of good fortune in bringing about the capture of Mack's force.

Two days after the review in honour of the capitulation of Ulm came the news of Trafalgar, which caused Napoleon to hurry off with the main body of his army to meet the Russians who were approaching. Ney's corps was sent off to Innsbruck, and was for some time employed in preserving order in the Tyrol. Subsequently, orders were sent to Ney to join the Grand Army, but he only reached Salzburg on the 10th December, 1805, in time to hear the news of Austerlitz.

Perhaps the most notable event during the next nine months, as far as Ney was concerned, was the appointment to his Staff of Jomini, whose character, as portrayed by General Bonnal, does not appear in a very favourable light. Considerable prominence is given to a letter which Jomini wrote to Ney three months after his appointment to Ney's Staff. In this letter (a facsimile of which is produced in the book) Jomini asks Ney (1) to recommend him for the Legion of Honour, (2) to lend him 1,500 francs, (3) to ask the Emperor to grant him field allowances (to which he was not entitled).

General Bonnal says he has reproduced the letter "to show the voracious appetite of the deserter of 1813!"

The 14th October, 1806, found Ney and his corps at Nuremberg at the commencement of the Jena campaign. The account which General Bonnal gives of the part played by Ney in this campaign is interesting, but adds nothing to our knowledge of the Battle of Jena itself, or of the events leading up to it. After the battle, Ney was sent to besiege Magdeburg, and on the surrender of that place was ordered successively to Berlin, Frankfort on the Oder, and Posen. Subsequently he was sent to invest Thorn, which place he captured on the 6th December, 1806. A week later he sent Berthier an appreciation of the situation which is well worth perusal, and is especially interesting in view of subsequent events. Ney's part in the events leading up to the Battle of Eylau is described by General Bonnal in considerable detail, and a good deal of space is devoted to accounts of the constant quarrels between Ney and Bernadotte, under whom Ney's corps had been placed. These quarrels culminated, as did Ney's

disputes with Murat, in the Emperor sending Ney a severe reprimand through Berthier. General Bonnal again sides entirely with Ney and blames Bernadotte, whom he describes as "a knave and a bad comrade."

After Eylau, Ney's corps formed the rear guard of the Grand Army during its retreat on Freimarkt. The hardships and severe fighting which fell to the lot of Ney's corps during the winter of 1805-06, as well as the brilliant operations of this corps round Guttstadt in June, 1807, and the events of the Battle of Friedland, are all vividly described by General Bonnal.

The present volume of the famous Marshal's life closes with the signing of the Treaty of Tilsit and the departure of Ney for Paris.

General Bonnal is to be congratulated on having made yet another valuable addition to military literature. Apart, however, from its military value, the volume is exceedingly interesting reading, and will doubtless be welcomed by civilian as well as by military readers.

Zurich-Masséna in Switzerland. (Zurich-Masséna en Suisse.) By Captain L. Hennequin, Historical Section of the French General Staff. 559 pp., with 8 sketches and maps. 8vo. Paris, 1911. Berger-Levrault. 9s. 7d.

This book deals with the operations of Masséna in Switzerland during a critical period in the History of France, namely from July to October, 1799. Nothing could have been more unfavourable, from the French point of view, than the general situation at the commencement of the summer campaign of 1799. In Italy, Joubert had been beaten at Novi by Field Marshal Suvarov. In the Netherlands, General Brune was, with difficulty, making headway against a hostile population, and in Switzerland, Masséna had been obliged to abandon Zurich and retire behind the Limmat. In France things were no better. There had been seditious outbreaks in the North, in the South, and in La Vendée, and the Government were at their wits' end to find the wherewithal to keep the Republican armies in the field. The safety of the country depended entirely on the army of Masséna which, in spite of the disadvantages under which it laboured, was alone capable of striking a blow at the forces of the coalition. The Directory were alternately begging and ordering Masséna to shake off his "inaction." The latter, however, fully conscious of the responsibility which rested on him, determined to bide his time and to leave nothing to chance. Before resuming an energetic offensive, he resolved to strengthen his position and cover his right flank by occupying the St. Gothard. He realized that so long as he could hold on firmly to the so-called "Swiss bastion" he would be able to avert any danger of invasion either from the direction of the Alps or the Rhine. He, moreover, required time to collect supplies and fill up his depleted ranks and, having accomplished this, his intention was to seize the first opportunity of striking a decisive blow at the enemy.

In the middle of August, Lecourbe's division, by means of a clever manœuvre, drove back the Austrians and once more occupied the St. Gothard. Towards the end of September, Masséna was ready to

move, and, taking advantage of the departure of the Archduke Charles for Germany, he fell with the whole of his force on the Russian corps of Korsakoff, on whom he inflicted a crushing defeat under the walls of Zurich. Then, turning immediately against Suvarov, who had crossed the St. Gothard, Masséna blocked all the approaches to Lucerne and Zurich, with the result that Suvarov was obliged to make a disastrous retreat to the Grisons. Masséna's operations not only freed France from the danger of invasion, but brought about the withdrawal of Russia from the second coalition. The operations are described with admirable clearness, and are illustrated by some very good maps and sketches. The fact, indeed, that this book is issued under the direction of the Historical Section of the French General Staff may be taken as sufficient guarantee of its excellence.

Three years in the Confederate Horse Artillery. By George M. Neese. 8vo. 362 pp. New York, 1911. Neale Publishing Company. 7s. 3d.

The author joined Captain Chew's well-known horse artillery battery, which was attached first to Ashby's and subsequently to Stuart's and Fitzhugh Lee's commands, on 13th December, 1861. He served continuously with it, except for one 15-days' furlough, until he was captured on North Mountain, near Woodstock, on 9th October, 1864. During the whole of the period he kept a diary, which is now made public. It is mainly personal, but provides many anecdotes of the commanders, many details as regards the country and the weather, and much of interest in relation to the methods of fighting.

He selected Chew's battery because its commander had been educated at the Virginia Military Institute and had studied the art of war, a rare advantage among battery leaders. He was very soon made "first corporal," which means first gunner in the battery. "I know," he writes, "very little about gunnery—in fact nothing except that a gun in good health never shoots backward." The diary, however, records that the gun carriage was constantly disabled as a result of firing at the long range of two miles; the high elevation necessary carried away the bolts of the mounting.

There are numerous little touches which throw light on the events of the war. Thus it is stated that during Jackson's Valley campaign, Ewell's men marched without baggage, having left all, "even their knapsacks, at New Market." During the North Anna period in 1864 General Lee is mentioned as driving about in a carriage, although it is often stated he was sick in his quarters. He records on 30th May, 1864:—"To-day was the first time I ever saw cavalry men engaged in the ditching and entrenching business."

General Moinier's Campaign. (Les Opérations du General Moinier.) By General de Torcy. 48 pp. and 2 maps. 8vo. Paris, 1911. Bureau des Questions diplomatiques et coloniales. 1s. 3d.

General de Torcy is an officer with a wide experience of colonial warfare; he has been through many campaigns in the French colonies,

and he recently followed the Spanish campaign in Melilla as correspondent of "Le Temps." His expert appreciation of General Moinier's expedition to Fez will probably be the most trustworthy book on the subject until the French official account is published.

The difficulties that the French had to contend with were those of which the British Army has considerable experience: transport arrangements had to be so organized that the six days' march between Kenitra and Fez could be covered rapidly and without a day's halt: troops had to be disposed to fulfil the double duty of dealing with a possible obstinate opposition in front, and, at the same time, of safeguarding a line of communications against a very mobile enemy who was a past master in raiding.

General Moinier contrived to carry out his rôle with such efficiency and with such an absence of "regrettable episodes" that there is a danger that the difficulties confronting him may not be appreciated. Not the least of his qualities was his determination not to start until everything was ready: nearly six weeks elapsed between the arrival of his first reinforcements and the departure of his main body from Kenitra, a delay which was fully justified by after events, but which must have been a sore trial to a fighting General anxious to relieve his compatriots in the beleaguered garrison at Fez.

With Napoleon at Waterloo. By MacKenzie MacBride. 244 pp., with 32 illustrations and index. 8vo. London, 1911. Francis Griffiths. 15s.

This work consists of a collection of hitherto unpublished documents dealing with the Egyptian Campaign of 1801, as well as with those of the Peninsular and Waterloo. The greater portion of the book is occupied by the diaries of two serjeants, both of whom belonged to the Gordon Highlanders. The comments of these two on what they saw and what passed round them are full of interest. One can well imagine the surprise occasioned by the appearance of the Gaelic speaking Turkish Governor of Marmorice on the "Statelty," on board which ship Serjeant Nicol, one of the men referred to, was being taken to Egypt.

The account which the other, Serjeant Robertson, gives of the retreat on Corunna forms a vivid picture of the sufferings endured, while his explanation of the chief causes of the loss of discipline are not less illuminating when it is remembered when and by whom it was written.

The Journal of Jardin Ainé, Napoleon's Equerry at Waterloo, is here translated and published for the first time. The account which he gives of that battle makes an interesting addition to its history.

The book contains a large number of interesting illustrations.

MEDICAL.

Manual of the St. John Ambulance Companies. By Lieut.-Col. G. E. Twiss, R.A.M.C. (retired.) 152 pp. and 43 illustrations. 8vo. London, 1911. St. John Ambulance Association. 6d.

This little manual has been written for the guidance of commandants when training their companies.

The first chapter is introductory ; it sets forth the objects for which the companies are formed, and describes the various medical units which these companies may be asked to establish. The duties of each rank in peace and on mobilization are clearly laid down ; a list of the equipment which a company should possess is also given.

Chapter II deals with the laws and customs of war.

The next chapter discusses buildings suitable for use as hospitals, and shows (with diagrams) how a school may be converted into a hospital. This scheme should be most valuable for voluntary aid companies as the author has shown all the indispensable annexes, *e.g.*, kitchens, latrines, pack store, &c., which are very likely to be forgotten when improvising a temporary hospital. The chapter also contains a list and description of the books which must be kept in a military hospital.

Chapter IV deals with nursing, and contains practical instructions for non-professional nurses. The first few pages of Chapter VI, the first page of Chapter VII, and the whole of Chapter VIII might well have been included in this one.

Chapter V takes dieting and cooking in hospitals and in the field. The next chapter deals with rest ; the portion on shelters would have been better placed in the chapter on " Improvization."

Chapter VII is headed " Cleanliness" and comprises a variety of subjects, *e.g.*, washing a patient, protection of food and water, disinfection of rooms, and patients' excreta.

Chapter IX deals with transport. It opens with the R.A.M.C. stretcher drill, and then takes transport by improvized means.

The last chapter, that on improvization, gives some good illustrations of knots ; but is not otherwise very full. The old-fashioned field latrine seems a little out of place in this chapter.

The manual should prove of great assistance to those engaged in training St. John Ambulance companies. In future editions, the matter might with advantage be re-arranged as suggested above.

Preparations to be made in anticipation of the Mobilization of Voluntary Aid Detachments of the (German) Red Cross Society. (Der Deutsche Kolonnenführer, No. 17, of 1911.)

The following notes are taken from a lecture delivered at the Fifth Annual Meeting of the Commanding Officers and Doctors of Voluntary Aid Detachments of the district of Upper Bavaria.

The lecturer began by pointing out how important it is that the executive of each voluntary aid detachment should be thoroughly acquainted with the steps to be taken when mobilization is ordered, and that all the necessary preparations should be made in peace time.

He then drew their attention to the importance of rendering accurate annual returns of the effective strength of the detachment, and warned his audience especially against including men still liable to military service.

In the annual return members of a voluntary aid detachment are classified into three groups.

I. Field and reserve personnel. (Feld und Ersatzmannschaften.)

Before placing a man's name on this list the executive of the voluntary aid detachments must satisfy themselves that he is :

- (1) Physically fit, not too old.
- (2) Thoroughly trained.
- (3) Likely to turn out when called on.

The men in this group must pledge themselves to serve for three months continuously on the line of communication if called on to do so.

II. Home territory personnel. (Heimatsmannschaften.)

Men belonging to this group must agree to serve away from their homes ; their duty is to undertake the care of sick and wounded convoys within the home territory. They are not required to serve for three months continuously like the field personnel. Each voluntary aid detachment must undertake to furnish one-third of its total peace strength for service in these groups.

III. Local personnel. (Ortsmannschaften.)

The men of this group are only liable for duty in their own locality. If they are in a besieged fortress they may be employed in the same way as the field personnel.

The central executive committee of the voluntary aid detachments furnishes the Minister of War annually with a consolidated statement of the resources in personnel and equipment of the whole country. The Minister of War then informs the central committee as to the special preparations for war which he wishes the committee to undertake. The committee thereupon makes its plans (Ausführungsbestimmungen), and passes its demands to the district committees, which in turn call upon the individual detachments to be prepared to furnish certain personnel for special duties.

A mobile unit will only be mobilized at a centre where facilities exist for the purpose in peace time. In Bavaria, Munich is the only centre. Individual voluntary aid detachments will therefore only be called on to furnish personnel as required. Uniform and equipment is stored in peace time by the detachment which is to carry out the mobilization. Men sent in by other detachments will be clothed and equipped in Munich, with the exception of boots, underclothing, water bottle, and knife. An allowance is given in place of boots.

In carrying out mobilization the time table (Mobilmachungs-Terminskalendar) must be strictly adhered to. As this is a confidential document it can only be referred to in general terms. In this time table the dates which have been fixed by regulations are shown in Roman numerals, the days which may be employed by the executive of the voluntary aid detachment according to their own discretion are shown in Arabic numerals. As an example, suppose that a hospital train is to be mobilized by the 15th day of mobilization, and a reserve personnel by the 21st day. On the I or at latest II day of the time table notice is to be sent to the detachment entrusted with carrying out the mobilization, if any of the personnel allotted to the unit cannot be provided. The next Roman numeral would be found opposite the VI day on which the

(1465)

Q

detailed personnel has to report at the headquarters of the mobilizing detachment.

On the XV day reports are to be furnished showing whether the reserve personnel is available or not.

On the XVIII day personnel detailed for the reserve must report at the appointed place. The other dates are left free to be employed by the mobilizing unit as it thinks best.

To continue the above example. On the 1st day, the executive of the voluntary aid detachments must make certain that the men selected for service on mobilization are actually available, and if not, must warn the waiting men. Should it be impossible to find the full complement required, immediate notice must be sent to the mobilizing detachment.

On the 2nd day the selected men should be medically examined as to fitness.

On the 3rd day if the orders to join have not been received from the mobilizing detachment they must be demanded by letter. These orders afford free railway transport.

On the 5th day arrangements should be made with the railway authorities to ensure that the men will arrive on the fixed day at the mobilizing centre. Their underclothing and necessaries should be checked, and their marching papers given out.

On the VI day the men report at their centre and receive their clothing, brassards, identity certificates, and service books. The value of their boots will be assessed for compensation. All outer clothing brought with the men will be taken into store and returned to their own centre.

Days not specially appropriated will be used for instruction to ensure that the men are thoroughly acquainted with their duties. The following arrangements should also be made by all executive committees when mobilization is ordered :—

- (1) Make fresh appointments to replace men detailed to units on mobilization.
- (2) For the conversion of war reserve funds into each.
- (3) Prepare war diary, mobilization accounts, and correspondence book.
- (4) Complete the medical equipment, supply of brassards, &c.
- (5) Prepare the necessary certificates for members belonging to the **Landsturm** for transmission to the district commander.

Orders for mobilization will be officially posted up in each district giving the first day of mobilization.

Improvised Methods of Aid in the Field. By Lieut.-Col. Mackay, R.A.M.C.T. 112 pp., with 2 diagrams and 45 illustrations. 8vo. London, 1911. Eyre and Spottiswoode. 1s. 6d.

This little work has been compiled by Lieut.-Col. Mackay for the use of Voluntary Aid Detachments and members of the Territorial Royal Army Medical Corps. The contents have been collected from a great variety of sources, and have been presented in a practical

way, which shows that Lieut.-Col. Mackay thoroughly understands the requirements and limitations of voluntary aid detachments.

The coloured diagram opposite page 92, showing the field medical organization of the Territorial Force, also illustrates the employment of voluntary aid detachments during an engagement. The administrative problem involved in distributing wounded to the 22 temporary hospitals of varying capacity would be somewhat difficult to solve.

The illustrations and descriptions of the different methods of improvization are good and clear. The work should prove of the greatest assistance to members of voluntary aid detachments, who owe Lieut.-Col. Mackay a debt of gratitude for the trouble he has taken in compiling this work.

Medical and Sanitary Report for the German Colonies. (Medizinal Berichte über die Deutschen Schutzgebiete für das Jahr, 1909-10.) Published by the German Colonial Office. 649 pp., with 45 diagrams, 13 illustrations and numerous tables. 4to. Berlin, 1911. Mittler. 11s.

This volume contains a carefully compiled record of the medical and sanitary work accomplished during the year. The most interesting parts of the report are those dealing with epidemic diseases in the German African Colonies. Small-pox, plague, malaria, anchylostomiasis, leprosy, and sleeping sickness are the main enemies to economic development of the country. Each of these diseases has been combated on a carefully thought-out plan, with the result that their incidence has been much reduced, their extension prevented, and it may reasonably be hoped that, in a few years, their effect on the welfare of the country may be reduced to a negligible quantity.

Much has also been done to alleviate suffering caused by disease amongst the native population as well as the Europeans. Many comfortable and almost luxurious hospitals have been built and equipped with all modern appliances. In these institutions the native, equally with the European, may obtain the benefit of the latest discoveries in medical science. The report is well worth reading by anyone interested in the problems of tropical medicine and sanitation.

ORGANIZATION AND ADMINISTRATION.

Organization, Administration and Equipment for India. By Captain Watson Smyth. 43 pp., with index. 12mo. Simla, 1911. Thacker, Spink & Co. 1s. 4d.

Officers working for promotion examinations will find this small pamphlet useful. The author outlines some of the principles and main heads of organization and administration in India without obscuring them with details which are constantly liable to alteration; clearly stated references show the reader where to look in the various regulations for the details required.

POLITICAL.

German Politics. (Deutsche Politik.) Volume I. Internal Politics. By Ernst Hasse. 674 pp., with index. 8vo. München, 1907. 14s.

This is the first volume of a series of works on German politics, the other two volumes being entitled "World Politics" and "Colonial Politics."

Volume I consists of four parts, viz. :—

- (1) The German Empire as a State.
- (2) Ethnography of the German Peoples.
- (3) German Frontier Politics.
- (4) The Future of the German Nation.

Part (1) deals with the rise of the German Empire, the nation and its requirements, and foreign powers.

Part (2) gives a detailed account of the settling of various parts of the Empire.

The history of each frontier is described in Part (3), while the future of the nation is dealt with in Part (4) at some length under the following headings: Population, race, health, town and country, armed forces, education, culture, and organization.

Europe and Young Turkey. (L'Europe et la Jeune Turquie.) By René Pinon. 484 pp., with 2 maps in the text. 8vo. Paris, 1911. Perrin. 4s.

M. René Pinon, the eminent contributor to the "Revue des Deux Mondes," has collected in the present volume a series of articles from his pen which have appeared from time to time in the "Revue."

The introductory article to the book bears the title "German and English Rivalry," and M. Pinon justifies the insertion of this article by the statement that "the rivalry between Germany and England dominates the political situation of our time . . . and is to be found at the bottom of all the crises which now periodically agitate Europe."

This introductory article originally appeared in the "Revue des Deux Mondes" in March, 1909, after the late King Edward's visit to Berlin.

The chapters following deal respectively with the Turkish Revolution, the present and future of Turkey (written in January, 1911), the annexation of Bosnia-Herzegovina, the question of the boycott as a weapon in international strife, the positions of Albania, Montenegro, Roumania, and the consideration as to the possibility of a Balkan Confederation (written in June, 1910).

The chapter on the weapon of the boycott will be read with especial interest at the present juncture, in view of the Turkish threat in this direction against Italy.

There is a useful index to the book, but the maps are hardly sufficient for their purpose.

The Southern Slav Question. By R. W. Seton-Watson. 452 pp., with 1 map. 8vo. London, 1911. Constable. 12s. 6d.

The problem which is here clearly and comprehensively presented by Mr. Seton-Watson seems likely to become, in the near future, the chief pivot on which the policy of Austria-Hungary will turn.

Though linguistically united and springing from a common origin, the 10,500,000 members of the South Slavonic or Serbo-Croatian race are at present divided between four independent monarchies; some 3,000,000 being inhabitants of Serbia, Montenegro, and Turkey, while the remaining 7,500,000 are included, under four separate, or semi-separate governments, in the Austrian Empire.

The manner in which growth of national consciousness and desire for unification are obliterating former religious and political divisions is clearly described, and a sympathetic account is given of the struggles, past and present, of the kingdom of Croatia-Slavonia to free herself from her oppressively predominant partner Hungary. Mr. Seton-Watson rejects the idea of confederation under the hegemony of Serbia as impracticable, and gives good reasons for regarding an eventual unification of the whole South Slavonic race under the sceptre of the Hapsburgs as the most probable and satisfactory solution of the problem. The events which led up to the recent Agram treason trials, and their connection with those relating to the annexation of Bosnia-Herzegovina, are very fully described. Though written with somewhat pronounced anti-Hungarian bias, the book cannot fail to be of great value, both to those who desire to master the main conditioning factors of Austro-Hungarian policy, and to those who wish to make a comparative study of Home Rule problems in countries other than their own.

STRATEGY AND TACTICS.

Lectures on the Strategy of the Russo-Japanese War. By Brevet Lieut.-Col. W. D. Bird, D.S.O. (late Professor, Indian Staff College.) 124 pp., with maps and plans. 8vo. London, 1911. Hugh Rees. 4s. 6d.

A new edition of the work already reviewed in "Recent Publications of Military Interest" of October, 1909, p. 55.

Lecture I is a short study of the military geography of the theatre of operations, and Lecture II, with Appendices I to III, describes the organization, strength, and military value of the Russian and Japanese sea and land forces.

In Lecture III, on strategical considerations, the author, having pointed out that apparently naval supremacy—in other words, the power of controlling maritime communications—was for both sides the decisive factor, proceeds to the discussion of the objectives which the Russians and Japanese respectively could, under these conditions, select, and the plans which each might adopt for the attainment of the objective.

The two next lectures contain narratives of the operations; Lecture

IV, up to the battle of Liaoyang, and Lecture V, of the events preceding the battles of the Sha Ho and Mukden.

The value and importance of the command of the sea, of the initiative, of a sound distribution of force at the commencement of operations, and of national enthusiasm for the particular campaign are some of the "lessons of the war" which are touched upon in Lecture VI.

Appendices IV to XII give the strength and distribution of the Russian and Japanese forces in the field from April, 1904, to February, 1905.

The Tactics of an Army. (*Tactique d'Armée, Marches, Stationnements, Ravitaillement.*) By Lieut.-Col. Marcel Menu. 380 pp. 8vo. Paris, 1911. Lavauzelle. 8s.

This is a useful book for staff officers who will find many valuable lessons on the management of the marches of large masses of men and on their feeding. The author gives frequent examples from the Napoleonic campaigns and also from the 1870 war, and shows how impossible it is for large forces, say two army corps, marching on one road, to cover distances over 12 miles unless the troops are billeted in an area the depth of which is approximately equal to the length of the column. The last two chapters contain, incidentally, a very clear account of the French supply system.

Two Lectures. (*Deux Conférences. La Notion de Sûreté et l'Engagement des Grandes Unités.*) By Colonel de Grandmaison. 76 pp. 8vo. Paris, 1911. Berger-Levrault. 2s.

In February last, Colonel de Grandmaison, who was head of the "Bureau des opérations Militaires," delivered to the officers of the Army Staff two lectures, which gave rise to much discussion in military circles because the opinions expressed by the lecturer did not meet with the approval of some of the senior officers present. Colonel de Grandmaison has now published his lectures.

In this country we are so apt to consider the so-called French doctrine as authoritative and universal that this book will probably cause some surprise. For Colonel de Grandmaison preaches the "offensive" in its most uncompromising form, and ruthlessly throws on the scrap heap the strategic advanced guard and "masse de manœuvre." Before describing the author's arguments it may be well first to point out that they refer to a large force (say an army of 3 or 4 corps) and are directed to the overthrow of the idea that a general advanced guard in contact with an enemy like the Germans will enable the commander of the force to manœuvre his main body, which must be formed in great depth if it is to manœuvre.

Briefly stated, Colonel de Grandmaison's arguments are that—

(a) The general advanced guard is incapable of fulfilling the task assigned, since either it will be immediately outflanked by the advancing columns of the enemy, or it must take up a frontage approximately equal to that of the enemy, in which case the line will be weak throughout and

must be supported by the main body. The latter can only do this effectively if it is already disposed on a broad front, a condition which is incompatible with ability to manœuvre.

(b) Even if the system of the general advanced guard and the manœuvring mass were practicable, it would still be wrong, since its adoption must lead to an almost complete atrophy of the offensive spirit. For the commander asks the advanced guard to find out what the enemy is doing, and he thereby subordinates his action to that of the enemy.

The author asserts again and again that to attack an enemy quickly and energetically is the only method of defence.

In the second lecture, the broad principles of the tactics which the author advocates are laid down. He demands an army marching in several columns on a broad front, each column, of course, preceded by its own advance guard. The cavalry divisions ahead have been given definite orders, and their duty is to find out where the enemy is, not what the enemy is doing. They have the further mission of covering the main army while it traverses districts in which a general and prompt attack is impossible. The commander must dispose his army during the march so that he can alter the direction if necessary, provide for unforeseen events, and give greater weight to his attack at certain points. The columns will march on a broad front and will be given definite orders to reach certain objectives, which the commanders of columns must attain in spite of the enemy. The army commander will keep at his own disposal some reserves, but the employment of the latter must be determined by their position, and, in this respect, the commander must be acting on a preconceived plan. The reserves will, of course, take part in the attack, and must be used not to support weak points but to reinforce the strong ones.

It has only been possible in this review to give a very brief and incomplete account of Colonel de Grandmaison's book, which is worth serious study by all officers, whether they agree with the author's ideas or not.

The Battles of Napoleon. (*La guerre napoléonienne—les batailles.*) By Colonel Camon. 571 pp., with an atlas containing 17 maps. 8vo. Paris, 1910. Chapelot. 6s. 8d.

This book forms the third part of the author's work entitled "The theory of Napoleonic War" (*Théorie de la guerre napoléonienne*) of which the two previous parts, entitled "Précis of Napoleon's campaigns" and "Napoleon's systems of operations," have already been published.

The author says he finds that there is a generally accepted idea that men of genius never work on a system, and that, consequently, many people refuse to allow that Napoleon acted in a systematic way when arranging his plans of battle. Colonel Camon's study of Napoleonic battles has, however, convinced him that just as the Emperor had two systems of manœuvre (*i.e.*, striking the enemy's rear and acting against the enemy's centre) so he had two systems of battle, namely :—

(1) Turning the enemy's flank.

- (2) Occupying a central position, containing the enemy over a certain portion of the front with an inferior force, and bringing an overwhelming force to bear on a selected point.

The second of these "systems" was, according to the author, not often employed, only, in fact, when Napoleon was inferior in numbers to the enemy; the first "system" was Napoleon's "normal" one, and was the one nearly always resorted to. The author has taken as types of system (2) the battles of Leipzig and Rivoli, and of system (1) the battles of Castiglione, Marengo, Jena, Allenstein, Eylau, Friedland, Wagram, Lützen, Bautzen, Ligny, and Waterloo. Each of these battles is worked out in considerable detail, and emphasis is laid on the points which confirm the author's theories, whilst other points which are at variance with them are noted as "exceptions which prove the rule." The book is certainly interesting, and the author's theories are ingeniously worked out, but there are a number of somewhat obvious flaws in his arguments, and the reader may find himself a little wearied by a good deal of unnecessary repetition. The contents of the book could with advantage be condensed into half the number of pages, but apparently space is of no consequence to the author, who promises several more volumes on his theory of the Napoleonic system of battle.

TELEGRAPHS AND COMMUNICATIONS.

Chinese Railways. (*Les Chemins de fer de Chine.*) By Edouard de Laboulaye. 337 pp., with 1 map. 8vo. Paris, 1911. Emile Larose, Libraire-Editeur. 6s. 3d.

M. de Laboulaye, a banker now living in Peking, has given a very up-to-date and concise account of Chinese railways from a financial point of view. M. de Caix, editor of the "*Bulletin du Comité de l'Asie française*," supplies a preface, in which he points out that the book is of great interest, not only to financiers, but also to those who wish to understand the influence that railway concessions in China have had upon the political history of the Far East.

The book opens with a brief history of Chinese railways, which M. de Laboulaye divides into three periods:—

- (1) From 1863 to 1894, during which period the railway question was first introduced and stubbornly resisted.
- (2) From 1894 to 1905, when, after China's disastrous defeat in the Sino-Japanese War, her weakness rendered her incapable of resisting the foreign demands for concessions.
- (3) From 1905 to the present day, the period which has seen the rise of "Young China," determined to develop her own resources without foreign assistance.

The greater portion of the book is devoted to brief accounts of railways constructed, under construction, or projected. The agreements entered into by the Chinese Government with foreign governments and the loan contracts are added in each case, generally in English.

Some useful tables are given. One shows the loans contracted by China for railway construction with the dates of their redemption. A second gives in detail the sums that China will have to pay for the redemption of the various lines, the total of which reaches the huge sum of approximately 64½ millions sterling.

TRAINING AND EDUCATION.

Instructions for the Trial of a Simplified Method of Musketry Training in the Infantry and Rifles. (Instruktion zur Erprobung einer vereinfachter Schiessausbildung bei der Infanterie und Jägertruppen.) Official. 28 pp., with 3 illustrations and 9 tables. 8vo. Vienna, 1911. Seidel. 5d.

(1) These new instructions, which modify and supplement the Musketry Manual of 1905, have now been introduced into the Austro-Hungarian Army.

They simplify and shorten the present courses of instruction, and have been issued in view of the impending reduction of the period of Army service from three to two years.

(2) The annual allowance of 150 rounds per man, and 500 rounds per company, remains unaltered, but is, in future, to be expended as follows :—

70 rounds	{ Elementary practice (a) Preliminary } 200 to 400 yards	
	(b) Ordinary } range.	
	Classification practice	200 to 600 yards range.
10	„	Field service firing and practice ... (a) Individual.
10	„	„ „ „ „ ... (b) By squadrons, as skirmishers.
20	„	„ „ „ „ ... (c) By sections as a firing line.
30	„	„ „ „ „ ... (d) By larger units, as ordered.
10	„	Special practices (a) Long range firing.
From the company allowance of 500	{ (b) Using auxiliary marks.	
	(c) With machine guns.	
	{ (d) Experimental and various.	

(3) The chief modifications other than the above are :

- (a) The use of extra full or fine sights is prohibited. The normal aiming point is to be the centre of the ground line of the target.
- (b) Great stress is laid on the importance of trigger pulling practice.
- (c) The maximum of accuracy expected is limited to a surface 1½ times the 100 per cent. accuracy rectangle of the rifle.
- (d) The “grouping” system is to be the sole basis in carrying out and judging elementary practice.

- (e) All bull's eye and other targets, except figure targets of three standard sizes, are prohibited.
- (f) Musketry registers and returns are cut down in number and simplified.

The Solution of Tactical Problems. (*Résolution des problèmes tactiques.*) By Captain Audibert. 120 pp. and 4 maps. 8vo. Paris, 1911. Berger-Levrault. 2s. 11d.

The author, who is a graduate of the French Staff College, considers that the majority of officers show an entire want of method in the solution of tactical problems, and that many of them, when asked to solve a problem, first decide on a particular course of action, and then set to work to find reasons to justify it. This book is, therefore, written with the idea of showing officers how to deal systematically with tactical problems. It is divided into three parts, namely:—

- (a) Part I, which explains the general system proposed by the author for dealing with problems.
- (b) Part II, in which a number of simple problems, given to the students of the Cavalry School, are worked out with a view to showing how the system described in Part I can be applied to particular cases.
- (c) Part III, in which more difficult problems, set at the Staff College entrance examination, are dealt with in accordance with the author's system.

In the appendices there are a number of exercises for the student to work out for himself. These exercises consist of problems given to students at the Staff College and the Cavalry School, as well as map problems in which two sides are represented. The solutions are, as a whole, interesting, and the maps clear.

The idea of solving tactical problems by the help of a so-called "system" is, of course, no new one, and Captain Audibert's "system" appears open to the same objections, and to lay the student open to the same dangers, as others of a similar kind.

Infantry Training. (*Exerzierreglement für die Fusstruppen*, 1911.) Official. 301 pp. 8vo. Vienna, 1911. Seidel. 1s.

A new edition of this manual, which corresponds in great measure to a combination of our "Infantry Training" and "Field Service Regulations," has now been issued in a provisional form. In Austria-Hungary, as in other countries, the military pendulum tends to swing from the previous fixity of rule and regulation to generalities, within the limit of which considerable freedom is permissible. This tendency is reflected in these regulations. Since the last issue of the book in 1903, the lessons of the Russo-Japanese War and the development of machine guns, telephones, motor transport, and scientific appliances generally, have necessitated considerable modifications in tactical methods; these modifications have been suitably embodied in the manual under review. The chief points in which the present edition differs from that of 1903 are alluded to below.

The first chapters of the new manual point out that infantry is the main arm, and alone has the power of obtaining decisive results; they further lay stress on the supreme importance of will power, determination, and tenacity as the main factors of success.

Recruit training generally remains unaltered; a little training in night work is added to the course of instruction. The importance of organizing channels of communication in every unit for passing orders and intelligence, both internally and externally, is strongly brought forward. Squad leaders, who formerly were expected only to pass orders and to supervise their execution, are now entrusted with considerable responsibility, and may order and regulate the delivery of fire. A company when encadred is now allowed a maximum firing front of 200 yards, as against 150 yards allowed by the old regulations; a battalion at peace strength is, as before, limited to a fire front of 400 yards. The old idea that reserves should carry the firing line forward with them is abandoned. They will, if used for the reinforcement of a direct firing line, join it, and swell the volume of fire, before again advancing. Emphasis is laid on the importance of the bayonet, and it is stated that "the enemy is cowed and worn down by fire, his last resistance is shattered by the bayonet." Attention is called to the importance of constant reconnaissance not only before but during battle. Economy of force is recognized as a necessary principle, the misuse of which, however, often leads to piecemeal attack and failure. General reserves in a decisive action must be put in to a man, and never kept as an insurance against defeat. Such action amounts to keeping them to mitigate an evil which their retention has itself caused.

The manual of 1903 regarded artillery as an arm, which opens and prepares the way for the infantry. The present edition states that artillery by itself cannot turn out a staunch and well-posted enemy, and the advance of the infantry cannot therefore be made dependent on its action. Generally speaking, infantry will have to advance and force the enemy to offer a target.

Whenever possible a strong offensive, which alone gives decisive success, is to be adopted. Enveloping methods are to be aimed at, provided that the simultaneous frontal attack can be made fierce, determined, and dangerous. In encounter battles every effort is to be made to seize and retain the initiative. An attack on an enemy in a deliberately occupied position must be carefully prepared and organized, and will often have to be carried out under cover of darkness, the assault being delivered at dawn. A general counter-attack is to be regarded as the chief weapon to be employed in defence; small local counter-attacks, delivered to the front, are to be deprecated. The paragraphs dealing with night operations have been considerably amplified, and new chapters have been added on the tactics of mountain, village, and wood fighting, together with one on operations in close country.

TRAVEL AND TOPOGRAPHY.

Finland To-day. By George Renwick. 337 pp., with numerous illustrations and map. 8vo. London, 1911. Fisher Unwin. 10s. 6d.

The preface to this work by H. W. Nevinson might lead the reader to suppose that the object of the book is to further the aspirations of certain political parties in Finland. The author's purpose is, however, to describe the "Land of a Thousand Lakes," and to give a sketch of Finnish activities in literature, art, and social progress. The book contains much historical and geographical information and a wealth of anecdote, which renders it a great contrast to the ordinary guide book. A chapter of special interest is devoted to the people of Finland and the characteristics of the various races.

The Outlines of Military Geography. By Colonel A. C. MacDonnell (late R.E.). 2 vols. (1 of maps.) 8vo. London, 1911. Hugh Rees. 12s. 6d.

These two volumes give a concise and useful outline of the military geography of those countries which are of chief military interest to Great Britain. In the first two chapters the question of sea power and considerations affecting the selection of a theatre of war are discussed. These are followed by four chapters devoted to Europe, Africa, India, and the Far East and Canada, while the last four chapters deal with such matters as strategic waterways, projected railways, ports, and food and cable routes.

As an introduction to the study of military history and strategy, the book should prove of value, and will help to bring home to the reader the extent of the Empire's land frontiers and the responsibilities involved by them.

The second volume contains a series of maps, and forms an essential part of the work. It is, however, to be regretted that a considerable number of the names of places mentioned in the text do not appear on the maps.

MISCELLANEOUS.

Turkey and its People. By Sir Edwin Pears. 396 pp. 8vo. London, 1911. Methuen. 12s. 6d.

This volume is the most recent of the many publications which have lately appeared dealing with the Turkish Empire and its peculiarities. In the present instance, however, the book is something more than what may be termed a somewhat superficial glance at the country from a visitor's point of view, such as has been the case in many of the previous books alluded to. Sir Edwin Pears' compilation is more in the style of Sir C. Eliot's famous work "Turkey in Europe," and deals closely with the intricate questions inherent to the Turkish rule. To a purely military reader, there is little of strictly professional interest, but for one who wishes to master the general aspects of the Ottoman problem and to learn what is the actual position now in Turkey, no better study can be

presented than the exposition now presented by so great an authority as Sir Edwin. Going to Turkey in 1873, the author, after practising in the Consular Courts, was appointed President of the European Bar in 1888, and has remained resident at Constantinople since that date.

A Military Word and Phrase Book. (Sammlung Militärischer Ausdrücke in systematischer Ordnung.) By Professor F. Sefton Delmer. 234 pp. 12mo. Berlin, 1912. Bath. 3s. 8d.

In the author's own words, this book is intended for the use of officers who are preparing for the Staff College Entrance Examination, or for the Interpreter's Examination. The method of arrangement is to group all the important words or phrases dealing with a particular subject under one heading, sometimes divided into a number of sub-headings, *e.g.*, Weapons (main heading), subdivided into The Lance, The Sabre, The Bayonet, &c. Each sub-heading is numbered, there being 407 such sub-headings; each word or phrase mentioned in the sub-heading has its corresponding number both for the German and its English equivalent. A list of all the main headings and subdivisions is published at the beginning of the book, whilst the student is further assisted by small indexes both of German and English words at the end of the book. Practically all ordinary military subjects are dealt with, and the list of words for each subject is very complete, including practically all useful terms.

Professor Delmer is to be congratulated on the production of a German-English military dictionary which cannot fail to be of the highest utility to all students and translators of modern German military works and writings. He has carried out his work with great thoroughness and accuracy, whilst its scope and method of arrangement render it a most useful book—more valuable indeed for the German student of English than for the Englishman studying German military terms, but also of considerable utility for the latter.

German for Military Students. By F. G. Zimmermann, M.A. 590 pp. 8vo. London, 1911. Hugh Rees. 8s. 6d.

The author does not believe that linguistic ability is natural or a particular gift, but realises that it is the result either of good teaching in early life or of a sound instructional system assisted by hard work and a trained memory. The main object of the British officer is to learn military German; this forms only a small portion of the German language, but of course the study of military German must include a certain amount of general knowledge, grammar, conversational terms, &c.

Herr Zimmermann has attempted to place in the hands of military students a book which contains everything they can require, all collected in handy form, in order to facilitate its assimilation, and to save time and labour. In this he has succeeded, and students using this book will find their task greatly shortened, whilst no excessive demands are placed upon their mechanical memory. Many officers have no time to learn the whole language, and confine themselves to a study of military German; for

these especially the book will be most useful, but it will also be of great assistance to all soldier students of the German language.

Herr Zimmermann has considerable experience in teaching German, particularly military German, and this experience has enabled him to produce a book of great utility and value.

The system adopted in the book is to deal with each subject by short and interesting essays, then discussing and analysing them, and gradually developing a vocabulary of the military and technical terms connected with the subject. This method appears to be sound and practical, and is certainly far more interesting than mere lists of words, which are certain to be dry, and cannot fail to be a serious strain on the memory. The essays are followed by a little necessary grammar, and the book concludes with a small index of important words.

The essays cover a great deal of ground, the following subjects being among those treated :—

Certain battles in 1870–71.

The siege of Strassburg.

Preparations and mobilization.

German Army organization.

Training of troops of different arms.

Clothing and equipment.

Armament.

Marches.

Transport.

Billets and bivouacs.

Intelligence and reconnaissance.

Protection. Outposts.

Orders.

Supply.

Topography.

Land Settlement for Soldiers. By Colonel Henry Pilkington, C.B.
101 pp. 8vo. London, 1911. Clowes. 2s.

The main purpose of this interesting book is to draw closer the connection, which at the present day can hardly be said to exist, between the soldier and the land. The need for this connection is based on the assumption that agriculture is the final source of the nation's fighting power. Is this assumption correct? Quite apart, however, from this aspect of the subject, the possibility of finding a suitable career for ex-soldiers is sufficient justification for the trial of a scheme of the nature here outlined.

The author frankly admits that he possesses insufficient data to enable him to make concrete proposals with confidence. It is to be hoped that he may succeed in obtaining support for one thorough experiment in spite of the difficulties which he is himself the first to admit.

Essays and Criticisms. By the Military Correspondent of "The Times." 292 pp. and 2 maps. 8vo. London, 1911. Constable. 7s. 6d.

This volume contains a reprint of a number of the author's recent contributions on various military questions of interest.

The chapters deal with the following subjects :—

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| Chapter | I. The Defence of the Empire. |
| " | II. The Imperial General Staff. |
| " | III. The Future of Army Organization. |
| " | IV. Australian Defence. |
| " | V. The Division at War Strength. |
| " | VI. Horses and Mobilization. |
| " | VII. The Armament of Cavalry. |
| " | VIII. A Veteran Reserve. |
| " | IX. Lord Roberts and his Critics. |
| " | X. Indian Military Policy. |
| " | XI. The Abolition of the Military Supply Department. |
| " | XII. Lord Kitchener's Work in India. |
| " | XIII. New Wars for Old. |
| " | XIV. The General Staff under Napoleon. |
| " | XV. The French Artillery. |
| " | XVI. Tendencies in the German Army. |
| " | XVII. Austria and Italy. |
| " | XVIII. The Japanese Army. |
| " | XIX. The Dutch Defence Bill. |
| " | XX. The Home Army of our Needs. |

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AERIAL NAVIGATION.

Military Aircraft in the Light of Experience. By William Fraser. U.S.M., September, p. 642.

Progress in Aeronautics. By Major H. Bannerman-Phillips. U.S.M., September, p. 658 ; October, p. 93 ; November, p. 208.

Conferences on Military Aviation. (To be continued.) By Naval Sub-Lieutenant Lafon. L.S.M., November, p. 177.

Flying Machines at the Manœuvres of 1911. M.A.G., November, p. 1055.

Aeroplanes and Cavalry. By Captain Boullaire. R.M.G., August, p. 205.

Notes on Aeronautics. The Stigel-Mannsbarth Dirigible—Measures for the Avoidance of Accidents when Flying. O.M.Z., August, p. 1383.

ARTILLERY.

Pack Artillery, its Organization and Employment in : (a) Desert Warfare ; (b) Siege Operations ; (c) Field Operations ; (d) Home Defence. By Captain W. St. G. Kister, R.G.A. P.R.A.I., September, p. 243.

Some Krupp Balloon Fuzes. By Colonel H. A. Bethell, late R.A. P.R.A.I., September, p. 280.

The Employment of Siege Batteries with the Field Army. By Lieutenant-Colonel J. G. E. Wynne, R.A., P.R.A.I., September, p. 283.

Territorial Artillery Development. By Lieutenant-Colonel Holmes Wilson, R.F.A. U.S.M., October, p. 75.

Four Guns or Six ? B.A., October 20th, p. 429.

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On the Loss of Rotational Velocity of Shrapnel Shell. By Captain H. J. Jones, A.O.D. P.R.A.I., November, p. 369.

The Employment of Heavy Artillery in the Field. By R. G. A. P.U.S.I., October, p. 445.

Mountain Artillery on the Mekran Coast in 1910. By Lieutenant H. E. Kenyon, R.A. P.U.S.I., October, p. 385.

Indirect Laying from Safety Positions. By Major Sautereau du Part. R.d'A., p. 357.

The Present Value of Horse Artillery. By F. Hershelman. V.S., Part I, No. 5, May.

The Effect of various Projectiles. By Lieutenant-Colonel de Giorgi, Austro-Hungarian Army. M.A.G., October, p. 891.

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The Coast Defences of the United States of America. By Captain Stavenhagen, German Army. M.A.G., October, p. 944.

Ballistics, Penetration and Explosive Effect of Heavy Projectiles. By Lieutenant de Georgi. M.A.G., November, p. 1003.

Optical Instruments for Artillery Purposes. By Lieutenant Hudler. M.A.G., November, p. 1022.

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Applied Studies in the Firing of Fortress Artillery. By Captain Florian, Austro-Hungarian Army. M.A.G., September, p. 840.

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The Instruction of Artillery with a view to its Employment in Large Masses. By Colonel X. R.M.G., August, p. 137.

The Employment and Effect of Modern Field, Mountain and Heavy Artillery, and Co-operation with the other Arms. By Lieutenant Hudler, Austro-Hungarian Army. O.M.Z., August, p. 1281.

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The Future of Cavalry. By "Cavalryman." U.S.M., September, p. 649.

The French Cavalry School at Saumur. By Lieutenant H. J. Solomon, A.S.C. A.S.C., October, p. 579.

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A French view of the German Horse-breeding and Horse-supply System. By Dr. Paul Goldbeck. K.M., October, p. 789.

Cavalry in Fortress Warfare (Attack and Defence). K.M., September, p. 654.

Various Notes concerning Cavalry. K.M., September, p. 654.

The Course for Jumping Competition in Frankfort and Paris. By Captain Zimmer, Austro-Hungarian Army. K.M., September, p. 676.

Correspondence regarding Cavalry. K.M., September, p. 697.

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Bridging with the Burma Sappers. By Brigadier-Major R. L. McClintock, D.S.O., R.E. R.E.J., September, p. 129.

Girder Bridges for Military Engineers. By Captain E. N. Mozley, R.E. R.E.J., September, p. 137 ; October, p. 193 ; November, p. 265.

A Simple Apparatus for Sounding Rivers and Ponds of Moderate Width. By Brigadier-General C. Penrose, C.B., R.E. R.E.J., September, p. 145.

The Use of Entrenchments and Cover. By Captain C. H. Brand. Commonwealth Mil. Journal, September, p. 488.

Mechanical Flares. By Captain A. C. Thackwell, 81st Pioneers. P.U.S.I., October, p. 451.

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Russo-Turkish War, 1877-78. Operations of General Gurko against Philippopolis. O.M.Z., November, p. 1775.

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Cavalry in the Japanese War and in the Past. (With Maps.) By F. Hershelman. V.S., No. 6, June, p. 71 ; No. 7, July, p. 53 ; No. 8, August, p. 53 ; No. 9, September, p. 49. (To be continued.)

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The War in Tonkin. (To be continued.) By Commandant Vautravers. R.T.C., October, p. 398.

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Two Japanese Cavalry Raids and their consequences. By Captain Beyer. O.M.Z., October, p. 1679.

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The Battle of Coulmiers. (To be continued.) By Lieutenant Mauguin. L.S.M., August, p. 215; September, p. 401; November, p. 226.

Essays on the Russo-Japanese War. By Captain de Saligny. R.M.G., August, p. 159; September, p. 288; October, p. 460.

Napoleon on Service. (To be continued.) By Lieutenant-Colonel Vachéo. R.M.G., September, p. 265; October, p. 427.

A Contribution to the Study of the Attack on Port Arthur. By Captain Glatter, Austro-Hungarian Army. O.M.Z., September, p. 1433.

The Russo-Japanese War; Criticisms and Observations by a Russian Officer who was present. (Continuation—O.M.Z., January, p. 87.) O.M.Z., September, p. 1479.

Letters of a General Officer of the Bavarian Cavalry (Grande Armée, 1812). R.C., July, p. 5.

The War in the South East of France in 1815. By Captain v. Möller, Austro-Hungarian Army. O.M.Z., August, p. 1253.

MEDICAL AND SANITARY.

An Experimental March to investigate the Amount of Food required by Men on Active Service. J.R.A.M., September, p. 289; October, p. 411; November, p. 526.

The Nutritive Value of Bread made from Different Varieties of Wheat Flour. J.R.A.M., November, p. 487.

Extemporized Stretcher and Adapted Cart. By Major S. P. Silver, R.A.M.C. J.R.A.M., November, p. 495.

Field Cooking. By Lieutenant and Quartermaster C. W. Kinsella, R.A.M.C. J.R.A.M., November, p. 497.

The Aseptic Treatment of Burns and Scalds. By Major F. J. W. Porter, D.B., R.A.M.C. S.R.A.M., November, p. 500.

Rifle Wounds. Communicated by the Austrian School of Musketry. O.M.Z., November, p. 1913.

School Hygiene in Military Schools in Austria-Hungary. By Dr. Adolf Deutsch. O.M.Z., August, p. 1329.

MISCELLANEOUS.

Agadir. N.R., September, p. 43.

The Imperial Conference, 1911. By Richard Jebb. N.R., September, p. 123.

Albanians, Turks, and Russians. By H. N. Brailsford. C.R., September, p. 321.

Foreign Affairs. By Dr. E. S. Dillon. C.R., September, p. 408.

The Danger Ahead. By Harold Cox. N.C., September, p. 414.

The De-militarization of India. By Major Aubrey O'Brien, C.I.E. U.S.M., September, p. 626.

Volunteering in India. By Captain R. Monck-Mason. U.S.M., September, p. 635.

Improvized Armies of the Nineteenth Century. By T. N. Maguire. J.U.S.I., September, p. 1121.

The Value of the Arme Blanche with Illustrations from the Recent Campaign. By Captain T. Seki. J.U.S.I., September, p. 1147.

The British Army and Modern Conceptions of Wars. J.U.S.I., September, p. 1181.

Asiatic Turkey under the Constitution. By G. L. Bell. B.Mag., October, p. 425.

Letters of a Self-made General to his Son. By Fantassin. U.S.M., October, p. 53.

British Diplomacy and Canada. By Lieutenant-Colonel D. A. Mills, R.E. U.E., October, p. 683.

The Siege of Delhi: a Reminder from one who was present. By General Sir F. R. Maunsell, K.C.B. N.C., October, p. 726.

The West Point Military Academy. By R. I. Harvey-Gibson. A.S.C., October, p. 555.

The Messing of the Soldier in Peace and War. By Captain R. J. Kentish, R. Ir. Fus.

The Gyro-Compass. B.A., 20th October, p. 430.

England and Germany. By Noel Buxton. C.R., November, p. 605.

Military Cryptography. By Captain M. Muirhead, R.F.A. J.U.S.I., November, p. 1321.

The War in the Mediterranean. J.U.S.I., November, p. 1349.

Across Norway. By Colonel J. M. Beamish (late R.A.M.C.). J.R.A.M., November, p. 513.

The Empty Places. By H. S. Gullett. U.E., November, p. 775.

Britain and Germany: an Appeal to Parliament. By J. H. Whitehouse. N.C., November, p. 828.

The National Interest in the Franco-German Dispute. By E. D. Morel. N.C., November, p. 834.

Germany's Mediterranean League: a Letter from Berlin. By R. C. Long. F.Rev., November, p. 874.

Hannibal. By C.F.M. U.S.M., November, p. 139.

Recruiting for the Territorial Force. By Æsculapius. U.S.M., November, p. 188.

Soldiers and Strike Duty. By V. H. Shobest. U.S.M., November, p. 204.

Finding One's Way by the Heavens. By Captain P. Barton, R.F.A. P.R.A.I., November, p. 339.

Elementary Astronomy for Military Purposes. By Capt. A. G. Thompson, 58th Rifles, I.A. P.U.S.I., October, p. 433.

Use of Tobacco in the Army. By Lieutenant-Colonel P. Helier, I.M.S. P.U.S.I., October, p. 393.

The National Service League's Scheme. By Colonel C. E. Callwell, C.B. N.D., October, p. 356.

Universal Service or Not? By a Territorial Adjutant. N.D., October, p. 365.

The Co-operation of the People in National Defence. By Captain F. W. Maycock, D.S.O. N.D., October, p. 427.

The Army Review and its Conductors. N.D., October, p. 438.

The Chinese Army. (Translation.) J.U.S.I., November, p. 1479.

Recent Progress in Firearms and War Material. O.M.Z., November, p. 1881.

The Importance to an Officer of a Knowledge of Accounts. O.M.Z., November, p. 1899.

Why India lags behind. By Saint Nihal Singh. N.C., October, p. 739.

The Recruiting of Natives in Indo-China. By E. Couzineau, Civil Administrator in Cochin China. R.T.C., October, p. 349.

Penetration in the Western Portion of the Ivory Coast (January-April, 1911). By Lieutenant de Cernon. R.T.C., October, p. 329.

The Ironworks of Austria. By Chief Engineer Halkowich, Austro-Hungarian Army. M.A.G., September, p. 806 ; October, p. 957 ; November, p. 1050.

The Frontier between the Ubanghi and the Egyptian Sudan. By Captain Modat, R.T.C., August, p. 113 ; September, p. 277.

The Intelligence Department. (To be continued.) By Commandant de Blondeau. J.S.M., 15th October, p. 413.

Hand Grenades. By A. H. J.S.M., Vol. 11, 1st October, p. 260.

Military Panoramic Sketching. By Lieutenant-Colonel Quinclet. R.M.S., October, p. 784.

The new Italian Regulations for Non-Commissioned Officers. O.M.Z., September, p. 1499.

The Bad Results of Long Storage of Small Arm Ammunition, and the Best Means of Avoiding the Same. By Captain Hermann, Austro-Hungarian Army. M.A.G., September, p. 793.

The work of the Swiss Pioneer Troops during the Floods in 1910. (Official Account.) M.A.G., September, p. 846.

The Conditions of Life of the Senegalese in North Africa. By Lieutenant-Colonel Aubert. R.T.C., July, p. 1.

Customs and Beliefs of the Hovas. By Lieutenant Zipcy. R.T.C., July, p. 71.

Declarations of War, from the point of view of International Law. By Dr. Gaston Bellot. L.S.M., August, p. 196.

The Price of War. By Captain Lauth. J.S.M., August, p. 389 ; September, p. 50.

The use of Frozen Meat and of Horse Flesh with an Army in the Field. By Commissary Tlappek, Austro-Hungarian Army. O.M.Z., August, p. 1335.

The Trans-Iranian (With Map). R.M.E., October, p. 262.

The Tiger's Den. By Lieutenant A. K. Hay, R.H.A. P.R.A.I., October.

Indian Drafts. By "Ration Post." P.R.A.I., October.

MOTORS AND MOTOR TRACTION.

Looking Ahead. By Major A. C. F. Cumberlege, A.S.C. A.S.C., October, p. 565.

NAVAL.

Naval Strategy. By Captain St. Pierre. Translated from the Italian by Lieutenant Winkler. O.M.Z., October, p. 1635 ; November, p. 1785.

ORGANIZATION AND ADMINISTRATION.

The Organization of a Battalion in War and Peace. By Captain G. T. Scovell, Q.O. Cameron Highlanders. J.U.S.I., November, p. 1293.

Infantry Organization. A.N.G., 11th November, p. 1069.

The Reorganization of the Russian Army. J.U.S.I., November, p. 1455.

The Strength and Organization of the Armies of France, Germany, Austria, Russia, Italy, Mexico and Japan. J.U.S.I., November, p. 1333.

The Present Organization of the Military Supply Services in Austria-Hungary. By V. Nedzvyetski. I.J., No. 8, Part II, August, p. 1.

POLITICAL.

German Policy in the Light of History. By Thomas Kirkup. N.C., September, p. 428.

The Morocco Crisis and the European Situation. By J. Ellis Barker. F. Rev., October, p. 590.

The Dilemma of German Policy. By "Diplomaticus." F. Rev., October, p. 627.

Foreign Affairs. By Dr. E. S. Dillon. C.R., October, p. 561; November, p. 712; December, p. 861.

The Peace of Europe. By D. C. Boulger. U.S.M., October, p. 1.

The Chinese Revolution. By Arthur Diosy. C.R., November, p. 704.

Tripoli. By "Tobruk." N.R., November, p. 369.

Dr. Sun Yat Sen and the Chinese Revolution. By J. Ellis Barker. F. Rev., November, p. 778.

The Knell of the Triple Alliance. By "Y." F. Rev., November, p. 803.

The Policy of Brute Force. N.D., October, p. 315.

The Ottoman Empire. By "Asiaticus." N.D., October, p. 325.

Germany and England. By Professor Michael. C.R., December, p. 757.

France and her Congo. By E. D. Morel. C.R., December, p. 806.

Sir Edward Grey's Stewardship. By "Diplomaticus." F. Rev., December, p. 963.

An Anglo-French Alliance? By Sidney Low. F. Rev., December, p. 999.

The Peril of Invasion: Italy's "Bolt from the Blue." By Archibald Hard. F. Rev., December, p. 1044.

Austro-Italian Relations. By Lieutenant Rinieri. L.S.M., September, p. 420; November, p. 204.

The Italians at Tripoli. By "Kepi." B.Mag., December, p. 820.

STRATEGY AND TACTICS.

Infantry in Grand Tactics. By Captain A. F. Henderson, 27th Cavalry, I.A. P.U.S.I., October, p. 363.

Infantry Formations in the Plains. By Lieutenant-Colonel C. H. Clay, 28th Gurkha Rifles. P.U.S.I., October, p. 377.

The Second Battle of Plevna. By Captain S. W. H. Rawlins, R.F.A. J.U.S.I., November, p. 1439.

Some Strategical Questions, British and Foreign. By Lieutenant-Colonel A. Pollock. N.C., October, p. 795.

The Attack of Airships and Aeroplanes. By Lieutenant Polster. K.T.Z., p. 361.

Application of Fire. Some technical considerations by Captain J. Neumann. O.M.Z., November, p. 1869.

Japanese Manœuvres in 1910. O.M.Z., November, p. 1905.

The Duration of the next War. By Major Mordacq, with a note by General Langlois. R.M.G., October, p. 385.

Preparation for War. (To be continued.) By Major Debeugny. R.M.G., October, p. 437.

Warfare in Tonkin. (To be continued.) By Commandant Vautravers. R.T.C., September, p. 225.

The doctrine of National Defence. (Concluded.) By "S." R.M.G., July, p. 97; August, p. 228; September, p. 359.

Tactics. New Letters to a Young Officer. (Concluded.) By General Bernard. R.M.G., July, p. 69; August, p. 194; September, p. 348.

Indirect Fire for Infantry Machine Guns. By Lieutenant Fonsagrivo. J.S.M., 15th October, p. 477.

Do the Strength and Organization of the Smaller Tactical Units, as well as that of Army Corps and Armies in Austria-Hungary, correspond to the Requirements of Modern War? By Captain Rodić, Austro-Hungarian Army. O.M.Z. September, p. 1409.

The leading of Small Detachments in Equatorial Forests. By Lieutenant Debrand. R.T.C., July, p. 11; August, p. 147.

The Marching of Armies on a Large Scale. (Concluded.) By General Bonnal. J.S.M., August, p. 241.

The Liberty of Action of Generals-in-Chief. (To be continued.) By Commandant Dupuis. J.S.M., August, p. 261; September, p. 5.

The Rôle of the German Fortifications on the Left Bank of the Rhine in a Franco-German War. By Lieutenant Multrier. J.S.M., August, p. 335.

An actual Strategic Situation: the Preliminary Stage at Mukden. By Commandant Mordacq, of the French Staff College. R.M.G., July, p. 5.

Composition and Rôle of the Advanced Guard in the German Army. By Commandant A. N. L.S.M., 15th August, p. 246.

The Tyranny of the Fire-arm. (To be continued.) By Captain Linares. J.S.M., 15th August, p. 369; 15th September, p. 129.

Infantry Scouts. By Captain Fabre. J.S.M., 15th September, p. 201.

TELEGRAPHS AND COMMUNICATION.

Imperial Telegraphs. (Part II.) By Charles Bright, F.R.S.E. U.E., September, p. 622.

Proposed Railway from the Mediterranean to India. By C. E. D. Black, Esq. J.U.S.I., November, p. 1409.

The various systems of Multiplex Telegraphy. By Major W. O'Meara, C.M.G. R.E.J., December, p. 353.

TRAINING AND EDUCATION.

The Opening of the R.M. College of Australia. Commonwealth Mil. Journal, September, p. 474.

Military Education and the Staff College. By "S. C." P.U.S.I., October, p. 355.

The Service of Inter-communication (T.F.). N.D., November, p. 399.

Brigade Training. By Major A. F. Sargeaunt, R.E. R.E.J., December, p. 329.

Bayonet Fighting. By Captain Laur. L.R.I., 15th October, p. 289; 15th November, p. 424.

The Education of Infantry. By Captain Arduset. L.R.I., 15th November, p. 459.

Critique of the new Manual of Infantry Training for the Austrian Army. O.M.Z., October, p. 1607.

The new Musketry Instructions. Observations by the Austrian School of Musketry. O.M.Z., October, p. 1731.

Some Remarks on the Study of Military History by Regimental Officers. By Lieutenant Franz Endres. M.W.B., Beiheft 8, 1911, p. 263.

A detailed statement of the Lectures delivered at Meetings of Military Societies in Austria-Hungary in the Winter of 1910-11. O.M.Z., September, p. 1507.

Communications from the Austro-Hungarian School of Musketry. The introduction of a simplified course of Instruction in Musketry. O.M.Z., September, p. 1529.

The Relation of National Education to Military Service in Switzerland. By Captain v. Helmar, Austro-Hungarian Army. O.M.Z., August, p. 1313.

Communications from the Austro-Hungarian School of Musketry. Tactical Exercises for Cavalry Machine Guns. (With Diagrams.) O.M.Z., August, p. 1355.

TRANSPORT.

The Concentration of Troops by Rail. By Captain C. Watson, R.E. P.U.S.I., October, p. 417.

Considerations regarding the value of Technical Transport for Supply Services. O.M.Z., September, p. 1566.

TRAVEL AND TOPOGRAPHICAL.

The Stereoaautograph and Cartography. By General von Steeb. M.A.G., November, p. 995.

Exploration in Yunnan and Ss'chuan. By Dr. A. F. Legendie. B.S.G., October.

MAPS.

The following maps have been published by the Geographical Section, General Staff, during the past quarter, and are on sale to the public :—

AFRICA.

Uganda.—1 : 250,000. G.S.G.S. No. 2571. Sheets Masindi Port, Mubendi, and Lake Albert.

Northern Nigeria.—Liruen Delma, 1 : 62,500. G.S.G.S. No. 2584. (North C 32-1 IV, N.E.)

BOOKS, PAMPHLETS, &c., WHICH HAVE BEEN DISTRIBUTED TO REFERENCE LIBRARIES.

Report on the Examination for Certificates A and B, Cadets of the Junior and Senior Divisions, Officers Training Corps, May, 1911.

THE ARMY REVIEW, 1st October, 1911.

ABBREVIATIONS

W., published weekly; F., fortnightly; M., monthly; Q., quarterly;
V., at irregular intervals; A., annually.

* Periodicals which can only be purchased by subscription.

Abbreviation.	Name of Newspaper or Periodical.		Price.	Place of Publication.
A.F.	Bulletin du Comité de l'Afrique française ..	M.	2 frs.	Paris.
A.F.H.	Archiv für Schiffs- und Tropen Hygiene ..	½ M.	*	Leipzig.
A.H.M.	Annales d'hygiène et de médecine coloniale ..	M.	3 frs.	Paris.
A.J.	Artilleriskii Jurnal	M.	*	St. Petersburg.
A.M.B.	Artilleristische Monatshefte	M.	m. 2.50	Berlin.
A.M.P.	Archives de médecine et de pharmacie militaires	M.	2 frs.	Paris.
A.M.S.	Proceedings of the Aldershot Military Society	..	/6	London.
A.N.G.	Army and Navy Gazette	W.	/6	London.
A.N.R.	Army and Navy Register	W.	15 c.	Washington.
A.Q.R.	Imperial and Asiatic Quarterly Review ..	Q.	2/6	Woking.
A.S.C.	Army Service Corps Quarterly	Q.	2/-	Aldershot.
A.S.M.	Allgemeine schweizerische Militärzeitung ..	W.	*	Basle.
B.A..	Broad Arrow	W.	/6	London.
B.Mag.	Blackwood's Magazine	M.	2/6	Edinburgh.
B.M.J.	British Medical Journal	W.	/6	London.
B.P.B.M.	Bulletin de la Presse et de la Bibliographie militaires. (Supplement to J.M.O.B.) ..	F.	*	Brussels.
B.S.C.	Bulletin international des sociétés de la croix rouge	M.	50 c.	Geneva.
B.S.G.	Bulletin de la Société de Géographie	M.	*	Paris.
B.S.G.L.	Bulletin de la Société de Géographie de Lyon ..	Q.	2.50 frs.	Lyons.
B.U.	Bibliothèque Universelle	M.	2.50 frs.	Lausanne.
C.J.	Budgets of Foreign Countries	..	..	..
C.J.	Cavalry Journal	Q.	2/6	London.
C.Mag.	Canadian Magazine	M.	25 c.	Toronto.
C.M.G.	Canadian Military Gazette	F.	10 c.	Montreal.
C.O.J.	Colonial Office Journal	Q.	1/6	London.
Con.	Der Continent.. .. .	M.	m. 1.25	Berlin.
C.R.	Contemporary Review	M.	2/6	London.
D.M.S.	De militaire Spectator	M.	1 fr. 50	Haarlem.
D.M.Z.	Deutsche militärärztliche Zeitschrift ..	½ M.	*	Berlin.
E. ..	Engineering	W.	/6	London.
Ec. ..	Economist	W.	/8	London.
Emp.R.	Empire Review	M.	1/-	London.
E.R.	Edinburgh Review	Q.	6/-	London.
F.M.F.	Feuille militaire Fédérale	V.	40 c.	Berne.
F.Rev.	Fortnightly Review	M.	2/6	London.
I.J..	Intendanski Jurnal	M.	*	St. Petersburg.
I.M.G.	Indian Medical Gazette	M.	1 R. 4 a.	Calcutta.
I.M.T.	Indisch Militair Tijdschrift	M.	1 fr. 50	Batavia.
Inj..	Ingeniernii Jurnal	M.	*	St. Petersburg.
I.R...	Internationale Revue (Armeen und Flotten) ..	M.	m. 3.25	Dresden.
J.A.M.S.	The Military Surgeon. Journal of the Assoc. of Military Surgeons	M.	35 c.	Carlisle, Penn.
J.A.S.	Journal of the African Society	Q.	6/-	London.
J.D.A.M.	Jahrbücher für die Deutsche Armee und Marine	M.	m. 2.50	Berlin.

Abbreviation.	Name of Newspaper or Periodical.		Price.	Place of Publication.
J.M.O.B. ..	Journal militaire Officiel	M.	*	Brussels.
J.M.S.I. ..	Journal of the Military Service Institution ..	2 M.	50 c.	Governor's Island, New York.
J.M.S.S. ..	Journal of the Military Scientific Society (Russian)	Q.	1 Ro. 50 kop.	St. Petersburg.
J.R.A.M. ..	Journal of the Royal Army Medical Corps ..	M.	2/-	London.
J.S.M. ..	Journal des Sciences militaires	$\frac{1}{2}$ M.	*	Paris.
J.U.S.I. ..	Journal of the Royal United Service Institution	M.	2/-	London
J.U.S.I. ..	Journal of the United Service Institution of (N.S.W.)	A.	*	Sydney.
K.M. ..	Kavalleristische Monatshefte	M.	k. 2.	Vienna.
K.T.Z. ..	Kriegstechnische Zeitschrift	M.	m. 1.50	Berlin.
L. ..	Lancet	W.	/7	London.
L.A.F. ..	Comité de l'Asie française, Bulletin	M.	2.25 frs.	Paris.
L.B.M. ..	La Belgique militaire	W.	25 c.	Brussels.
L.R.I. ..	La Revue d'Infanterie	M.	2 frs.	Paris.
L.S.M. ..	Le Spectateur militaire	F.	2 frs.	Paris.
M.A.G. ..	Mittn. über Gegenstände des Art.- u. Genie-Wesens	M.	*	Vienna.
M. Art. ..	Memorial de Artillería	M.	*	Madrid.
M.B.A.R. ..	Monthly Bulletin of the Bureau of American Republics	M.	25 c.	Washington.
M.C. ..	McClure's Magazine	M.	25 c.	New York.
M.I.E. ..	Memorial de ingenieros del ejército	M.	*	Madrid.
M.P.G. ..	Mitteilungen Petermann's	M.	m. 2.	Gotha.
M.R. ..	Marine-Rundschau	M.	m. 2.	Berlin.
M.W.B. ..	Militär-Wochenblatt	$\frac{1}{2}$ W.	20 pf.	Berlin.
N.A.R. ..	North American Review	M.	35 c.	New York.
N.C. ..	Nineteenth Century	M.	2/6	London.
N.D. ..	National Defence	Q.	2/6	London.
N.G.M. ..	National Geographic Magazine	M.	25 c.	Washington.
N.I.A. ..	Nation in Arms	M.	/3	London.
N.M.B. ..	Neue Militärische Blätter	W.	60 pf.	Berlin.
N.M.T. ..	Norsk Militært Tidsskrift	M.	*	Christiania.
N.R. ..	National Review	M.	2/6	London.
O.M.Z. ..	Steffleurs militärische Zeitschrift, zugleich Organ der militär-wissenschaftlichen Vereine	M.	*	Vienna.
P.J. ..	Preussische Jahrbücher	M.	m. 2.50	Berlin.
P.P.R.E. ..	Professional Papers of the Corps of Royal Engineers	V.	..	Chatham.
P.R.A.I. ..	Journal of the Royal Artillery	M.	2/6	Woolwich.
P.U.S.I. ..	Journal of the United Service Institution of India	Q.	2 Rs.	Simla.
Q.D. ..	Questions diplomatiques et coloniales	F.	75 c.	Paris.
Q.R. ..	Quarterly Review	Q.	6/-	London.
R.A.G. ..	Rivista di Artiglieria e Genio	M.	*	Rome
R.C. ..	Revue de Cavalerie	M.	*	Paris.
R.d'A. ..	Revue d'Artillerie	M.	*	Paris.
R.D.D.M. ..	Revue des Deux Mondes	$\frac{1}{2}$ M.	3 frs.	Paris.
R. du G. ..	Revue du Génie militaire	M.	2.50 frs.	Paris.
R.E.J. ..	Royal Engineers' Journal	M.	1/6	Chatham.
R.F.E.C. ..	Revue française de l'étranger et des colonies	M.	2.50 frs.	Paris.
R.H. ..	Revue d'Histoire	M.	2 frs.	Paris.
R.I.C. ..	Revue Indo-Chinoise	F.	1.50 frs.	Hanoi.
R.I.M. ..	Revue du service de l'intendance militaire	M.	2 frs.	Paris.
R.M.B. ..	Revue de l'Armée belge	2 M.	*	Liège.
R.M.E. ..	Revue militaire des Armées étrangères	M.	1 fr.	Paris.
R.M.G. ..	Revue militaire générale	M.	2.50 frs.	Paris.
R.M.I. ..	Rivista militare italiana	M.	2 lire.	Rome.

Abbrevia- tion.	Name of Newspaper or Periodical.		Price.	Place of Publication.
R.M.L. ..	Revista militar	F.	200 reis	Lisbon.
R.M.S. ..	Revue militaire suisse	M.	*	Lucerne.
R. of R. ..	Review of Reviews	M.	/6	London.
R.T.C. ..	Revue des Troupes Coloniales	M.	2 frs.	Paris.
S.Z.A.G. ..	Schweizerische Zeitschrift für Artillerie und Genie	M.	*	Frauenfeld.
T.M. ..	Tour de Monde	W.		Paris.
U.E. ..	United Empire (Royal Colonial Institute Journal)	M.	1/-	London.
U.S.A. ..	United States Artillery Journal	2 M.	50 c.	Fort Monroe.
U.S.C. ..	United States Cavalry Association Journal	Q.	50 c.	Fort Leaven- worth.
U.S.I. ..	United States Infantry Association Journal	Q.	50 c.	Washington.
U.S.M. ..	United Service Magazine (Colburn's)	M.	2/-	London.
V.R.K. ..	Vyestnik Russkoi Konnitsi	F.	*	St. Peters- burg.
V.S. ..	Voyennii Sbornik (Military Journal)	M.	*	St. Peters- burg.
V.T.H. ..	Vierteljahrshefte für Truppenführung und Heereskunde	Q.	*	Berlin.

APPENDIX II.

A. NATIONAL RESERVE REGULATIONS.¹

1. The National Reserve, which forms a part of the military organization, is primarily a register of trained officers and soldiers who, being under no further obligation for military service, except as specified in para. 6, are organized under the auspices of County Associations, and encouraged by the military authorities with a view to increasing the military resources for national defence.

Its members are not required to undertake definite liability for military service. Their registration will, however, enable the military authorities to keep in touch with men who would be willing and able to render assistance in time of grave national emergency when additional personnel may be required, either for active duties with the home defence forces or for other services. The military authorities will keep touch with County Associations, with a view to ascertaining the extent of the assistance from the registered National Reservists that could be relied on in a time of national emergency.

2. Except in Ireland and the Channel Islands, where County Associations do not exist, County Associations alone are authorized to register names for the National Reserve, and to undertake its organization.

The registration of an officer or man in the National Reserve should usually be carried out by the Territorial Force Association of the county in which he resides. But, when such a course is mutually agreed upon by the Associations concerned, an officer or man may be registered as a National Reservist in any other county, provided that he is not borne upon the register of more than one Territorial Force Association.

3. County Associations will frame their own rules for the formation and organization of the National Reserve in their counties, subject to the following provisions. The names on the register are to be classified in the following manner:—

- (i) Officers under 55 years of age, and other ranks under 45 years of age, who are considered to be physically fit to join a combatant unit for service in the field.
- (ii) Officers between the ages of 55 and 60, and other ranks between 45 and 55, who are considered to be physically fit either for combatant duty in garrisons or other fixed positions or for administrative work.
- (iii) Officers and other ranks not qualified to be included in (i) and (ii), who will become honorary members of the Reserve, and be retained therein for social and influential purposes.

¹ Issued with Army Orders dated 1st November, 1911.

In the case of officers and men in classes (i) or (ii), the register should record the rank, arm, or branch in which the reservist last served, and any special qualifications or experience possessed by the reservist should be noted.

4. A grant of one shilling may be drawn in respect of each National Reservist registered in the books of a County Association on the 30th September in each year. This grant may be expended by the Association for the general purposes of the National Reserve in the county, including the expenses of an annual parade if one is held.

5. The following only will be eligible for registration in the National Reserve:—

- (a) Officers who have rendered satisfactory service for at least one year in any of the military forces of the Crown, provided that they are not on the Active List of the Regular Army nor on the Active or Unattached List of the Territorial Force, and that they do not belong to the Special Reserve. Officers who have rendered satisfactory service for at least one year in any of the military forces of the Dominions, Colonies, or Protectorates of the Empire, and are no longer liable for any service therein.
- (b) (i) Naval and Marine Pensioners over the age of 55, and men who have served in the Royal Fleet Reserve, but have left that force on completion of time for pension or gratuity, or for any reason, other than misconduct or inefficiency.
- (ii) Ex-Naval ratings and Marine ranks who have left the Naval and Marine Forces for reasons other than misconduct or inefficiency, and who are not under any liability to be called upon for further service in these Forces.
- (iii) Officers and men who have served in the Royal Naval Reserve, Royal Naval Volunteer Reserve, and kindred Colonial Forces, and who have left these Reserves and Forces for any cause other than misconduct and inefficiency. Royal Naval Reserve men who enrolled prior to the 1st April, 1906, and are in possession of Deferred Pension Certificates, are not eligible for registration in the National Reserve until they are 60 years of age.
- (c) Ex-soldiers of the Regular Forces who have completed their term of service, or who have been discharged after not less than one year's service.
- (d) Ex-soldiers of the Special Reserve who have completed their original engagement, or who have been discharged after not less than one year's service.
- (e) Ex-soldiers of the Territorial Force, including the Territorial Force Reserve, after not less than eight years' service with the colours, or with the colours and in the Territorial Force Reserve.
- (f) Ex-Militiamen who have completed one period of engagement.
- (g) Ex-Imperial Yeomen and ex-Volunteers not serving in the Territorial Force, and ex-members of analogous Colonial Forces who served the full term of their period of engagement, provided such period was not less than three years.
- (h) Ex-members of the Royal Irish Constabulary who have completed not less than four years' service with that force.
- (i) Individuals in possession of a War Medal duly granted to them.

6. Officers of the General Reserve of Officers and Army Pensioners are permitted to join on the understanding that the registration of their names in the

National Reserve in no way interferes with their existing liability to military service.

7. No age limit is fixed for joining or leaving the National Reserve.

8. County Associations will be informed by Officers i/c Records of the names and addresses of all discharged soldiers, including Special Reservists, qualified to join the National Reserve who reside in their County.

9. County Associations are authorized to remove the name of any individual from the register of National Reservists without assigning any reason for so doing.

10. On 1st October in each year the Secretaries of County Associations will report to the War Office the total numbers of National Reservists on their registers at that date, showing officers and other ranks separately, according to the classification in para. 3.

11. Service in the National Reserve will not be reckoned towards the qualifying period for the Special Reserve Long Service and Good Conduct Medal, Territorial Decoration, or Territorial Force Efficiency Medal.

12. Local military authorities will do all in their power to second the efforts of County Associations to give the National Reserve a privileged position in the public life of the country. Its members will be officially recognized on national ceremonial occasions and at local military functions, and it is hoped that similar privileges will be accorded to them by county and borough authorities at public functions under their control.

13. Members of the National Reserve are permitted to take part at the funeral of a comrade in military formation, if desired, and to act as a firing party in accordance with King's Regulations.

14. The arms may be loaned and the necessary blank ammunition provided for the purpose of the preceding paragraph by Officers Commanding units of the Regular Army, Special Reserve, or Territorial Force from the quantities at their disposal. Apart from the cost of the blank ammunition expended, no expense in respect of these issues, either for cost of conveyance or otherwise, will be borne by the public.

15. In the event of National Reservists being employed on mobilization, they will receive army rates of pay and allowances according to the ranks and appointments in which they are employed.

16. Service rendered by National Reservists who are pensioners, if recalled and re-enlisted on account of a national emergency, will count towards an increase of pension.

17. In the event of County Associations forming rifle clubs or rifle associations for National Reservists, a limited number of rifles, for the use of members only, will be issued on "long loan" by the Army Ordnance Department to County Associations. The number to be issued will not in any case exceed 10 per cent. of the registered members on the strength of the rifle club or rifle association. In forwarding applications to the Chief Ordnance Officers, Secretaries of County Associations should attach a certificate showing the total number of National Reservists on the rifle club or rifle association registers at the date of application. A return (on A.F. G 1023) of the rifles on loan for this purpose will be transmitted annually by the Ordnance officers by whom the issues are made to the Secretaries of County Associations, who will sign a certificate at the foot of the return to the effect that the whole of the rifles are in possession of the rifle clubs or other National Reserve organizations administered by their Associations.

The cost of the carriage of the rifles on first issue to County Associations, and of the empty chests on return to store, will be borne by Army Funds; but it is to be clearly understood that no other expenditure in connection with any

subsequent transaction relating to them, or to the ammunition required for them, can be admitted against Army Funds.

18. Repairs to rifles will be carried out as a repayment service for County Associations at the nearest Army Ordnance Depôt, on application to Chief Ordnance Officers of Areas. The cost to be charged will be limited to the value of the material or components used in effecting the repairs, unless it becomes necessary to specially engage labour to carry out the work, in which case the labour charges actually incurred will be added.

19. Small-arm ball ammunition for practice with these rifles may be obtained through County Associations on payment at cost price, i.e., the vocabulary rate current at date of issue.

20. County Associations will apply to County Councils concerned for the exemption of these arms from licence duty.

21. Certain events at County Rifle Association meetings should be open to National Reservists.

22. Subject to the exigencies of the Service, National Reservists' rifle clubs may be allowed the use of military rifle ranges.

23. Parades of the National Reserve in each county area may be held under the direction of County Associations.

24. Members of the National Reserve will not wear uniform in their capacity as members of this Reserve.

25. County Associations may issue badges to be worn by National Reservists, provided that the designs of the badges have been approved by the Army Council. In no case will ribands be worn with these badges. These badges will not be worn in uniform.

26. Distinctive insignia, as required by The Hague Convention, will be supplied in time of war.

B. Reorganization of the Intercommunication Services of the Expeditionary Force for War.²—1. *Object*.—In order to co-ordinate the various methods of intercommunication made use of in the field, and thereby to ensure a more efficient and adequate system, it has been decided to reorganize the intercommunication units of the Expeditionary Force as an Army Signal Service.

The following war organization has been approved. Detailed War Establishments will be published in due course :—

2. *Organization of the intercommunication service in war*.—The service of intercommunication is carried out by—

The units of the Army Signal Service.

Intercommunication personnel forming part of other units (*see* Appendix C).

The Army Signal Service units to be provided are—

For a cavalry division ... A signal squadron.

For a cavalry or mounted brigade ... A signal troop.

For an infantry division ... A signal company.

With army troops ... { One or more air-line signal companies.
One or more cable signal companies.
One or more wireless signal companies.

On lines of communication ... One or more lines of communication signal companies.

The personnel and equipment provided with these units for intercommunication purposes, and the duties on which the units will be normally employed are given in Appendix A. The nomenclature of units is given in Appendix B.

² Army Order 809, 1911.

The personnel to be maintained in units other than Army Signal units is laid down in Appendix C, together with the number of bicycles allotted to each unit for intercommunication purposes in war.

3. *Administration of the Army Signal Service in War.*—The Army Signal Service is administered by the Director of Army Signals, who will have representatives at the following headquarters :—

At headquarters of Inspector-General A Deputy Director of Army
of Communications Signals.

At headquarters of an army An Officer i/o Army Signals.

At headquarters of a cavalry division... The Officer Commanding Signal
Squadron.

At headquarters of a division The Officer Commanding Signal
Company.

At headquarters of a mounted brigade The Officer Commanding Signal
Troop.

The duties of the Director of Army Signals and those of the Deputy Director of Army Signals, Lines of Communication, are laid down in Field Service Regulations, Part II, Section 24, 1. In the same section the relationship of the Director of Army Signals and the Director of Railway Transport in regard to the erection, maintenance and working of railway telegraphs is also laid down.

The Director of Army Signals will communicate directly with his representatives on all matters of administrative and technical detail connected with the Army Signal Service.

The duties of an Officer i/o Army Signals with the headquarters of an army, or of an officer commanding the signal squadron or a signal company with a division, are—

- (i) To act as technical adviser of his commander in matters pertaining to the Army Signal Service, receiving his instructions as regards its employment through the General Staff.
- (ii) Under the orders and within the limits of command of his commander, to be responsible for the general organization, maintenance, and efficiency of the service of intercommunication other than the postal service.

The commander of a signal troop with a cavalry or mounted brigade, or of a signal section with an infantry brigade, acts under the orders of the brigade commander, and has duties in regard to the signal service of the brigade analogous to those of an officer commanding the signal squadron with the cavalry division or a signal company with a division.

The duties of commanders of the units specified in Appendix C, and of signalling officers under them, in connection with the service of intercommunication are—

- (i) To provide such visual signal stations, &c., as may be necessary to complete the intercommunication between themselves and their superior commander or neighbouring units. (Field Service Regulations, Part I, Section 8, para. 2.)
- (ii) To arrange for intercommunication within their unit.

APPENDIX A TO ARMY ORDER 309.

TABLE SHOWING PERSONNEL AND EQUIPMENT PROVIDED FOR INTERCOMMUNICATION PURPOSES WITH EACH ARMY SIGNAL UNIT, AND THE NORMAL EMPLOYMENT OF THE UNIT.

Unit.	Means of Signal Communication available with Unit.	Normal Employment of Unit.
SIGNAL SQUADRON		
"A" troop ...	2 wireless (wagon) stations.	Intercommunication between cavalry divisional headquarters and general headquarters.
"B" troop ...	2 cable detachments, having 28 miles of cable and 8 vibrator offices.	General intercommunication within cavalry division, and to keep divisional headquarters in touch with wireless stations serving it, or with the permanent telegraph system of the country.
"C" troop ...	1 wireless (wagon) station.	Intercommunication between divisional headquarters and brigades or contact squadrons.
	3 wireless (pack) stations.	
"D" troop ...	12 mounted men ... 28 bicyclists ... 6 motor cyclists ... 2 motor cars ...	For visual signalling and despatch riding purposes in conjunction with other means of intercommunication.
SIGNAL TROOP WITH CAVALRY BRIGADE.	11 mounted men ... 6 bicyclists ... 3 motor cyclists ... 7½ miles of cable ... 8 portable telephones ...	For visual signalling and despatch riding purposes. For use with outposts and for making use of permanent lines in the country.
SIGNAL TROOP WITH MOUNTED BRIGADE.	11 mounted men ... 6 bicyclists ... 3 motor cyclists ... 7½ miles of cable ... 8 portable telephones ... 2 wireless (pack) stations.	As for signal troop with cavalry brigade. For intercommunication with general and cavalry divisional headquarters.
SIGNAL COMPANY WITH DIVISION—Headquarters and No. 1 Section.	3 cable detachments, having 30 miles of cable and 9 vibrator offices. 4 mounted men ... 8 bicyclists ... 9 motor cyclists ...	For intercommunication within the division, or as required. For visual signalling or despatch riding in conjunction with, or alternative to, the cable communication.

APPENDIX A TO ARMY ORDER 309—continued.

Unit.	Means of Signal Communication available with Unit.	Normal Employment of Unit.
SIGNAL COMPANY WITH DIVISION— <i>continued.</i> Nos. 2, 3, or 4 Sections.	2 telephone detachments, having in all 8 miles of cable and 10 portable telephones. 8 bicyclists	For intercommunication within the infantry brigades, or between them and the artillery. For visual signalling or despatch riding in conjunction with, or alternative to, the telephone communication.
SIGNAL COMPANY (WIRELESS).	3 wireless (wagon) stations. 9 motor cyclists ...	For intercommunication between general headquarters and cavalry divisional headquarters and mounted brigades. For despatch riding purposes.
SIGNAL COMPANY (CABLE) (a).	9 cable detachments, each with 10 miles of cable and 3 vibrator offices. 13 motor cyclists ...	For intercommunication between general headquarters and army or divisional headquarters as required. For despatch riding purposes.
SIGNAL COMPANY (AIR-LINE) (a).	6 air-line detachments, each having 10 miles of air-line and 2 second-class offices, also 24 miles of cable and 6 vibrator offices.	For intercommunication between general or army headquarters and the advanced base.
SIGNAL COMPANY (LINES OF COMMUNICATION).	100 miles of air-line and 10 offices, but equipment varies to suit local conditions.	For intercommunication on the lines of communication.

(a) The unit for employment is the *section* of two detachments. The headquarters of the company provides the personnel for administrative purposes at general and army headquarters.

APPENDIX B TO ARMY ORDER. 309.

WAR ORGANIZATION. TITLES OF ARMY SIGNAL UNITS.

1st Signal Squadron (for cavalry division).			
1st	}	Signal Troops (for cavalry brigades).	
2nd			
3rd			
4th			
6th	}	Signal Troops (for mounted brigades).	
7th			
1st	}	Signal Companies (for divisions).	
2nd			
3rd			
4th			
5th			
6th			
"A"	}	Signal Company (Air-line)	} For army troops.
"B"		"	
"C"		" (Cable)	
"D"		"	
"E"		" (Wireless)	
"L"	Signal Company (Lines of Communication)		For lines of communication.

APPENDIX C TO ARMY ORDER 309.

TABLE SHOWING PERSONNEL AND BICYCLES PROVIDED IN WAR FOR INTER-COMMUNICATION PURPOSES WITH UNITS OTHER THAN ARMY SIGNAL UNITS.

Unit.	Personnel.	Bicycles. (e)
Headquarters cavalry divisional artillery.	7 rank and file (a) ...	3
Headquarters divisional artillery. ...	7 " " (a) ...	2
Headquarters cavalry divisional engineers.	...	1
Headquarters divisional engineers. ...	...	1
Cavalry regiment. ...	{ 1 serjeant ... }	15
A squadron of Irish Horse. ...	18 rank and file (b) ...	4
Horse artillery brigade—	6 " " (f) ...	
Headquarters... ..	7 " " (c), (d) ...	3
Battery	6 " " (c) ...	3
Ammunition column... ..	3 " " (b) ...	3
Horse artillery battery with mounted brigade.	9 " " (c) ...	3
Mounted brigade ammunition column.	3 " " (b) ...	1
Field artillery brigade—		
Headquarters... ..	9 " " (c), (d) ...	1
Battery	6 " " (c) ...	1
Ammunition column... ..	5 " " (b) ...	1
Field artillery (howitzer) brigade—		
Headquarters... ..	7 " " (c), (d) ...	1
Battery	6 " " (c) ...	1
Ammunition column... ..	3 " " (b) ...	1

APPENDIX C TO ARMY ORDER 309—continued.

Unit.	Personnel.	Bicycles. (e)
Heavy artillery battery.	8 rank and file (c), (d) ...	1
Heavy artillery ammunition column ...	3 „ „ (b) ...	...
Divisional ammunition column. ...	6 „ „ (b) ...	6
Field troop.	3 „ „ (b) ...	...
Field company.	3 „ „ (b) ...	1
Air battalion.	9 „ „ (b) ...	10
Bridging train.	...	1
Infantry battalion.	{ 1 officer 1 serjeant 24 rank and file (b) }	9
Mounted infantry battalion.	{ 1 serjeant 18 rank and file (b) }	15
Mounted infantry company (divisional).	6 „ „ (b)	4
Cavalry divisional train.	...	37 (g)
Divisional train	...	30 (g)
Army troops train.	...	9 (g)
Mounted brigade train	...	9 (g)
Cavalry field ambulance.	...	2
Field ambulance.	...	1

(a) Includes 4 trained signallers.

(b) Trained signallers.

(c) Trained in signalling and telephonist's duties.

(d) Does not include driver for cable wagon.

(e) Provided for despatch riding and use of signallers as required.

(f) Despatch riders.

(g) For requisitioning duties and intercommunication.

C. SPECIAL INSTRUCTIONS FOR THE UTILIZATION OF THE LOCAL RESOURCES OF A COUNTRY BY AN ARMY IN THE FIELD.

(Issued with Army Order dated 1st November, 1911.)

NOTE.—1. These instructions are primarily for use by an Army operating in an enemy's country, and they will not be acted upon in a foreign friendly country unless the consent of the Government of that country has been obtained, in which case all concerned will be duly notified of the fact.

2. They are not to be used in the United Kingdom or any British Possession beyond the seas.

INTRODUCTION.

1. It is a principle that the mobility of an army may be prejudiced if absolute dependence for supplies, stores, animals, means of transport, and shelter from weather, is placed on what is carried with and belongs to the force, or can be

obtained from the base (*see* Field Service Regulations). It is, therefore, of the first importance that on active service the resources of a country should be utilized as far as possible for the support of an army in the field.

2. The General Staff will collect information respecting the principal resources of probable theatres of war, and the distribution of those resources. This information, together with directions regarding the general policy to be adopted towards the inhabitants and the civil authorities through whom goods and services will generally be obtained, will be circulated on the outbreak of hostilities, and if possible before mobilization.

3. Local resources may be utilized by :—

- (i) Requisitions of supplies, transport, stores, labour (such as that of drivers, mechanics, &c.), animals, &c.
- (ii) Billeting.
- (iii) Contributions of money.
- (iv) Purchase by contract.
- (v) Purchase in the open market.
- (vi) Confiscation.

4. Subject to the general or specific orders of a superior authority, the officer in command in a locality will decide which of the methods referred to in para. 3 may be employed.

He is empowered to billet his men and levy requisitions, but only the Commander-in-Chief, a general officer commanding an army, or a general officer commanding a less force if acting independently, can authorize the collection of money contributions.

5. Whether the army is operating in a hostile or friendly country, requisitions, demands for billets, contributions, or purchases, will be effected whenever possible through the local civil authorities, such as the mayor, magistrate, chief of police, or in their absence the principal inhabitant. Direct contact between the troops and inhabitants will be avoided.

6. When operations are to take place in a friendly country overseas, it may be assumed that communications will be made by the British Government to the government of that country, on or before the outbreak of hostilities, with the object of enabling a representative of the department of the Quartermaster-General to consult with the proper authorities regarding any modifications necessary to bring these regulations into agreement with the regulations in force in the friendly country.

At the same time arrangements will ordinarily be made as to the areas to be allotted to the British forces for the utilization of local resources, the instructions to be issued to the civil authorities to meet our demands, and the prices to be paid.

7. Except by written order under authority emanating from or delegated by the Commander-in-Chief, officers are forbidden to make promises, on behalf of the army or government, to any person as to compensation for property lost or destroyed during, or in consequence of military operations (*see also* para. 19).

8. A supply of the army forms and books referred to in these instructions, printed in English, will be held in the war equipment stationery boxes of general and army headquarters, the inspector-general of communications, headquarters of the cavalry division, headquarters of divisions, and headquarters of cavalry and mounted brigades. A further supply, printed in the language of the country in which operations are to take place, will be issued by the Central Requisition Office as soon as possible after the outbreak of hostilities.

SECTION I.—REQUISITIONING OF SUPPLIES. TRANSPORT,
STORES, LABOUR, ANIMALS, &c.

(a) *General Instructions.*

9. Requisitions can only be made for the needs of the army. The demands are to be in proportion to the resources of a country, and of such a nature as not to involve the inhabitants in the obligation of taking part in military operations against their own country.

The quantity of food to be left in the possession of the inhabitants must be decided by the commander ordering the requisition, who will be guided by local conditions. (The usual practice is to leave at least three days' supply of food for a household, and rather more than that at outlying farms or villages.)

10. The details of the requisitioning service will be arranged under the direction of the Quartermaster-General at the outbreak of hostilities, on information furnished by the General Staff.

In carrying out requisitioning services :—

- (a) Economy and foresight should be exercised in order to utilize the resources of the country to the best advantage.
- (b) Strict discipline should be observed in enforcing requisitions.
- (c) Careful records should be kept, and speedy settlement made of all claims.

It should be remembered that the knowledge that early payment is to be made will tend to facilitate compliance with the demands.

11. Scales of prices of articles and services, carefully compiled according to local circumstances for the various districts in which operations are to be carried out, will be drawn up by the Quartermaster-General's branch of the Staff, and published for the guidance of all concerned. As a general principle no increase in price by reason of the existence of military operations should be allowed.

12. On the outbreak of hostilities a Central Requisition Office will be established, the duties of which will embrace the registration, investigation, and assessment for payment of all requisitioning services in the theatre of war (*see para. 32*).

Sub-offices may be opened as found necessary.

13. Requisitions for the maintenance or formation of depôts will usually be made by officers of the administrative service or department concerned permanently posted in suitable districts, who will make themselves thoroughly acquainted with the local resources, and will be given necessary escorts.

14. Requisitions for current requirements will as a rule be carried out under divisional arrangements by officers of the administrative service or department concerned, who will whenever possible precede units to localities where articles and services are to be obtained. Escorts will when necessary be provided under the orders of the divisional commander, but in emergency, requisitioning officers may apply for protection to the nearest body of troops. The senior combatant officer will be responsible for the safety of the party and of the articles requisitioned until the latter have been handed over to the proper authority.

15. As a general principle only officers of the administrative service or department concerned detailed for the duty are authorized to requisition, but in cases of emergency, *e.g.*, when troops are on patrol duty, or where no officer of a service or department or duly appointed requisitioning officer is available, requisitions may be carried out by the commander, the circumstances being reported without delay to superior authority. Indiscriminate requisitioning and granting of requisition receipt notes are strictly forbidden.

16. Authority to requisition will not be delegated to any but a commissioned officer, and requisitioning on the part of warrant officers, non-commissioned officers, or men, will be treated as plundering under the Army Act, unless the case is one of extreme urgency and no commissioned officer is present.

17. Requisitions will generally be made by a demand on the form prescribed (A.F. F 780—see Appendix I), which may be altered to suit local conditions.

18. Personal services, such as those of mechanics, artisans, transport drivers, labourers, messengers, &c., may be requisitioned, subject to para. 9. If owners of transport are required as drivers or leaders, their personal services will be requisitioned.

A belligerent may not compel the inhabitants of the country with which war is in progress to furnish information regarding the army or national defences—consequently the services of guides may not be requisitioned.¹

19. Rent is not payable for buildings or land necessarily occupied for military purposes during war, nor can compensation be claimed for damage to, or destruction of, property caused by the necessities of war. If, however, time allows, a note of the occupation or damage should be made and transmitted to the nearest requisition office, so that there may be evidence to assist the assessors in the event of funds being provided by either belligerent at the close of hostilities to compensate the inhabitants.

20. Under the terms of the Hague Convention :—

“All means employed on land, at sea, or in the air, for sending messages, for the carriage of persons or things, apart from cases governed by maritime law, depôts of arms, and generally, all kinds of war material, may be taken possession of, even though belonging to private persons, but they must be restored, and the compensation to be paid for them shall be arranged for on the conclusion of peace.”

It is, however, preferable to obtain transport, stores, &c., on requisition. If in special circumstances requisitioning is not resorted to, a note of the condition of the articles taken and their ordinary commercial value at the time will be made and immediately transmitted to the nearest requisition office.

(b) *Executive Duties of Requisitioning Officers and Requisition Offices.*

21. All officers ordered to requisition will, before proceeding on the duty, receive detailed instructions as to—

(a) The resources of the neighbourhood in which the duties are to be carried out, and the attitude of the inhabitants.

(b) The direction taken by other requisitioning parties.

(c) The description and quality of the articles or services to be collected.

(d) The transport, if any, to be taken.

Officers will be held responsible for providing themselves with the authorized requisition forms, and for ensuring that unnecessary expense shall not be incurred through irregular methods of requisitioning.

22. Except when payment is made on the spot, the requisitioning officer will give to each local civil authority a requisition receipt note on the form prescribed (A.B. 361—see Appendix II) for all goods or services rendered.

When payment is made on the spot no acknowledgment for the goods or services will be given by the requisitioning officer, but a receipt for the amount paid will be obtained. Payment, whether immediate or deferred, will as a rule be made to the authority through whose agency the goods or services are obtained, and not to individual inhabitants.

¹ Germany, Russia, Japan and Montenegro do not subscribe to this prohibition, and a nation at war with those countries is not, therefore, bound by its provisions.

23. When in exceptional circumstances requisitioning has to be carried out direct, i.e., without the agency of the civil authorities, it will not be necessary to present a demand (A.F. F 780), but except when payment is made on the spot a requisition receipt note (A.B. 361) will be given to the owners for goods or services rendered.

24. Requisition receipt notes will in all cases be made out in triplicate, but *the original note only* will be given to the civil authority (or owner in the exceptional circumstances when requisitioning has to be carried out direct).

The *duplicate note* will be sent to the Central Requisition Office by the representative of the administrative service or department concerned, or, if no representative is attached to the force, by the commander.

The *triplicate note* will be sent as soon as possible by the representative of the administrative service or department concerned to the officer in charge of the *dépôt* from which supplies, &c., are next drawn, and will be the voucher for bringing the articles on charge in the *dépôt* account.

25. The original requisition receipt note will in no circumstances show the rank, unit or force of the requisitioning officer, but this information will in all cases be inserted by that officer on the duplicate and triplicate of the note.

26. Unless special orders are issued to the contrary, face values will not be entered on requisition receipt notes, and it will be notified for the information of all concerned that a requisition receipt note is merely a record of the transaction shown thereon. The quality of the articles should be indicated in each case by one of the words, "Good," "Average," "Indifferent."

27. In the case of animals, &c., of exceptional value, such as pedigree stock, suggestions as to value may be made by requisitioning officers on the back of the duplicate of the requisition receipt note, but not on the original.

28. Transport will be requisitioned similarly to ordinary stores, but separate requisition receipt notes should be issued. When transport is taken for temporary use only, and its early return is anticipated, this fact should be clearly shown on the requisition receipt notes, and when returned to the civil authorities (or owners) fresh notes showing the period of hire, &c., will be issued, the original notes being recovered and cancelled by the Central Requisition Office.

29. If goods are taken for protection and not for the use of the troops, a statement to that effect will be written by the requisitioning officer on the duplicate and triplicate of the requisition receipt note.

30. All authorities or persons to whom requisition receipt notes are given will be directed to send them at the earliest possible date to the officer in command of the nearest British garrison. This officer will give an acknowledgment (A.F. F 781—see Appendix III), and will *at once* transmit the notes to the Central Requisition Office.

31. Should requisition receipt notes be presented for payment, such payment will on no account be made until the notes have been forwarded to the Central Requisition Office, and the authority of that office to pay obtained.

32. The detailed duties of the Central Requisition Office will include:—

(a) *Registration*—

- (i) The registration and record of requisition receipt note books issued to troops in the field.
- (ii) The recording of all details in connection with claims sent in for settlement.
- (iii) The recording of requisition receipt notes notified as having been issued.

(b) *Investigation*, which should establish the genuineness of the claim.

- (c) Subject to para. 11.—*Assessment, i.e., fixing a fair and reasonable price for the goods and services requisitioned.*
- (d) *Payment.*—After investigation and assessment by the Central Requisition Office, payment may be made—
 - (i) Through the Army Pay Department ;
 - (ii) Direct to claimant by the Central Requisition Office, or by an officer specially authorized by the officer in charge of the Central Requisition Office, but all payments must be notified to Headquarters Army Pay Department.

33. Requisition Sub-Offices will report all claims to the Central Requisition Office for registration, and, generally speaking, no payment will be approved or made by a sub-office until the sanction of the Central Office has been obtained.

SECTION II.—BILLETING.²

34. Billeting is a convenient method of utilizing local resources, for by this means not only shelter but food may be provided with the minimum of trouble.

35. The general principles to be observed in allotment of billets are stated in Field Service Regulations, Part I.

36. Billets are of three descriptions, viz. :—

- (a) Billets with full subsistence.
- (b) Billets with partial subsistence.
- (c) Billets without subsistence.

When billets with subsistence are provided, officers and others must be satisfied with the usual fare of the householder on whom they are billeted, unless a special scale has been laid down by the military authorities.

Neither bedding nor furniture in billets can be demanded as a right., although such may be supplied through the goodwill of the householder.

All billets will include attendance, and—when required—the use of ordinary cooking utensils belonging to the inhabitants.

37. Demands for the provision of billets will be made as a rule on the local civil authorities on the form prescribed (A.F. F 788, *see* Appendix IVa), which may be altered to suit local conditions.

38. As soon as the proposed distribution of troops has been decided, brigade billeting areas will be allotted by the Quartermaster-General's branch of the Staff, and commanders of these areas will in their turn distribute the accommodation among units. Preliminary measures for quartering troops should, when possible, be taken in advance. In such circumstances billeting demands, together with any special orders to be observed by the inhabitants, should be issued by commanders of brigade areas to representatives of units, who will proceed with billeting parties to the localities apportioned to them.

39. A regimental billeting party should, if possible, consist of an officer or non-commissioned officer, and one rank and file per company, &c., for each unit concerned. Before starting for his allotted area, each officer (or non-commissioned officer) should receive a statement showing the number of officers, men, and horses for whom accommodation (and food if this is to be demanded) is required, and, if possible, the topography of the locality should be explained.

40. On arrival in the locality to be occupied, the officer (or non-commissioned officer) in charge of the party will proceed direct to the mayor, chief officer of police, or other official holding an equivalent position, to whom the billeting

² Instructions regarding the billeting of troops at their stations in the United Kingdom on mobilization will be found in the Mobilization Regulations.

demand will be handed, together with any instructions to be observed by the inhabitants. The mayor or other official will at the same time be notified of the hour at which the troops may be expected, and will be requested to supply information as to the existence of any infectious disease, to designate the house or locality affected, and to notify any special precautions to be taken in respect of water supply, sanitation, fire, &c.

41. A billeting order (A.F. F 787, *see* Appendix IV*b*) will, if time permits, be prepared by the local authority for presentation by the billeting party to each inhabitant on whom men and horses are to be quartered, and will show the number of men and horses to be received, and whether food and forage is or is not to be supplied.

42. On receipt of the billeting orders, the officer (or non-commissioned officer) in charge of the billeting party will issue them in proper proportion to the representative of each company, who will be given instructions regarding the posting of warnings outside infected buildings, special arrangements for watering, &c., and the place to meet the officer (or non-commissioned officer) when the billets have been inspected. The men of the party will then proceed to the houses and stables allotted to their respective formations, will inspect and mark the billets, and will hand the billeting orders to occupiers.

43. In the meantime the officer (or non-commissioned officer) will select and mark the position of the regimental headquarters, guard room, alarm post, sick inspection room, gun and transport parks, &c., and will ascertain the most suitable lines for communicating with neighbouring units, and the best roads into and out of the billeting area. This completed, he will, if possible, prepare for the information of the regimental commander a sketch showing the allotment of billets to the unit, and giving details regarding roads and communications.

44. On reassembling his men, he will notify them of the position of the headquarters, guard, &c., and a proportion will be despatched to convey this information to companies, and to guide them to their billets.

44*A*. When time is not available for the above procedure the troops will be halted outside their billeting areas. Meanwhile a party from each brigade area will proceed to the mayor or other official, to whom a billeting demand will be presented, and whose co-operation in the allotment of billets will be requested. The local authority will then take steps to notify to the inhabitants that troops will be billeted on them and will promulgate any military orders to be observed. At the same time the billeting party will roughly allot the accommodation as laid down in Field Service Regulations, Part I.

45. As a rule no payment will be made in respect of billets without subsistence. It may, however, be decided to make payment from funds provided at the close of hostilities, and the action referred to in para. 19 should accordingly be taken when time allows.

46. The rates to be paid for subsistence in billets—para. 36 (*a*) and (*b*)—will be fixed by the Quartermaster-General's branch of the Staff in accordance with para. 11.

47. Except when payment is made on the spot, requisition receipt notes will be given for all subsistence received, and these notes will be dealt with under the regulations laid down in Section I.

SECTION III.—CONTRIBUTIONS OF MONEY.

48. Contributions of money can only be demanded in order to meet the needs of the army or of the administration of the occupied territory. The collection of such contributions will be effected, as far as is possible, in accordance with the legal basis and assessment of taxes in force at the time.

The collection will, when practicable, be made through the civil authorities usually responsible for the collection of taxes, and for every contribution a receipt will be given to the contributors.

49. No contribution will be collected except under an order in writing, and on the responsibility of the Commander-in-Chief, a general officer commanding an army, or a general officer commanding a less force if acting independently.

50. Officers enforcing contributions will be held responsible that the monies are brought to account, and that all contributions are reported to Headquarters Army Pay Department.

SECTION IV.—PURCHASE BY CONTRACT.

51. The employment of contractors in areas under military government will be restricted as far as possible, in view of the likelihood of threats being used by them towards the inhabitants of a country when carrying out the terms of the contracts.

52. In cases where it is necessary to enter into contracts after military government has been proclaimed (and such cases will usually occur only at the base and on the lines of communication) special care will be exercised in deciding on the terms and conditions of those contracts. A clause should be inserted in all cases specifically laying down that contractors are not allowed to requisition articles or services of any kind—all such requisitioning must be done by the military authorities.

SECTION V.—PURCHASE IN THE OPEN MARKET.

53. Purchases in the open market are to be avoided, as high prices will be charged.

54. Purchases on a small scale may, however, be permitted in the case of isolated bodies, such as reconnoitring patrols, &c., and for this purpose money will be provided on imprest account. Those on a large scale will as a rule only be made to encourage the inhabitants to come forward with supplies and stores when other means of obtaining them have failed, or resort may be had to this system when it is desired to conciliate the people of the country.

SECTION VI.—CONFISCATION.

55. Private property cannot be confiscated.

56. The following regulations, which are based on the Hague Conference of 1907, govern the confiscation of public property :—

- (a) Real property of a military character belonging to the State, such as forts, arsenals, dockyards, magazines, barracks, railways, canals, bridges, piers, and wharves, may in the interest of the military operations be damaged or destroyed, or may be seized and retained till the end of the war.
- (b) Real property belonging to the State, which is essentially of a civil or non-military character, such as public buildings and offices, lands, forests, parks, farms, and mines, may not be damaged, unless this is imperatively demanded by the exigencies of war. Such property may not be confiscated, but may be made use of until the conclusion of the war.
- (c) All State property directly susceptible of military use, such as means of transport, appliances for the communication of news, depôts of arms, stores and supplies, may be confiscated, as may also movable property

belonging to the State, such as cash, specie, funds, and realizable securities which are strictly State property.

- (d) Movable property belonging to the State which is not directly susceptible of military use, such as Crown Jewels, pictures, collections of works of art and archives, cannot be confiscated, although papers in connection with the war can be seized even if forming a part of archives.

57. Details of all property confiscated will be reported immediately to General Headquarters and to the Central Requisition Office, and such property will be handed over to the representative of the administrative service or department concerned, who will as soon as possible report the details to the officer in charge of the dépôt from which supplies, &c., are next drawn (*see* para. 24).

ARMY FORM F 780.

APPENDIX I.

REQUISITION ON CIVIL AUTHORITIES.

As an Officer of the British Army, I, acting under powers conferred upon me hereby direct the Local Authorities of

to supply for the requirements of the troops, the following :—

to be ready at _____ on the _____ day of _____ precisely at _____ o'clock under the direction of an official appointed by the Local Civil Authorities for this duty, who will make delivery to the troops in accordance with instructions which will be addressed to him by me.

³ The question of payment will be taken up on production of the requisition receipt notes, which must be transmitted to the officer in command of the nearest British garrison.

In case of any disobedience on the part of the inhabitants in complying with the demands, the Local Civil Authorities will address the undersigned without loss of time in order that military force may be applied if necessary.

Place

Date

Signature of Officer

APPENDIX II.

REQUISITION RECEIPT NOTES.

Requisition receipt notes will be as on attached form, and will be issued in books.

The following instructions will be printed inside the cover of each requisition receipt note book :—

1. This book is for the use of all officers authorized to enforce requisitions.
2. Except when payment is made on the spot a requisition receipt note must be given to the local civil authority (or principal inhabitant) through whom the articles or services are requisitioned, whether such articles or services are taken for the use of the troops, or for protection.
3. The notes must not be given to inhabitants, except in the special circumstances when direct requisitioning has to be resorted to.

³ Alter as necessary if payment is to be made on the spot.

4. Requisition receipt notes will not be given for buildings or land occupied or in respect of property damaged or destroyed through the necessities of war.

5. When goods are taken for protection, a statement to this effect should be written on the duplicate and triplicate requisition receipt notes.

6. *When payment is made on the spot, no requisition receipt note whatever should be given, but a receipt for the amount paid will be obtained.*

7. Requisition receipt notes, which will invariably be made out in triplicate (carbon paper is provided for the purpose), must be legibly filled in, and should bear the full title, &c., and address of the authority or person from whom the articles or services are requisitioned and the signature of the requisitioning officer. The rank, unit, or force of the requisitioning officer will in no circumstances be shown on the original requisition receipt note, but will be inserted by him on the duplicate and triplicate notes.

The articles requisitioned must be fully described, so as to give all information necessary for the guidance of the officer who will settle the claim. The weight of the goods taken must in all cases be estimated and inserted on the note; it is not sufficient to merely state the number of bags or cases.

8. No money value is to be quoted on the requisition receipt note.

9. The *original note only* will be given to the local civil authority (or owner, in the very exceptional circumstances when requisitioning has to be carried out direct).

The *duplicate note* will be sent to the Central Requisition Office by the representative of the administrative service or department concerned, or, if no representative is attached to the force, by the commander.

The *triplicate note* will be sent as soon as possible by the representative of the administrative service or department concerned to the officer in charge of the depôt from which supplies, &c., are next drawn.

ARMY BOOK 361.

REQUISITION RECEIPT NOTE.

NOT NEGOTIABLE.)

No..... Date.....

Requisitioned from (full name).....

Address.....

Articles or Services requisitioned.	Quantity.	Quality (good, average, or indifferent).

Signature of Requisitioning Officer—

INSTRUCTIONS TO HOLDER.

The recipient of this note is required to deliver it up as soon as possible to the officer in command of the nearest British garrison, and at the very latest within one month from the date of receiving it. He will receive from that officer an acknowledgment for the note, which he can retain while the latter is passed on to the proper quarter as required by the British Army Regulations. Should he neglect to obtain this acknowledgment, which is intended to safeguard his interests in case of accident to the note, any consequences that may ensue will be his own fault. He is informed that this requisition receipt note will be examined and enquired into, and that he will receive a notice stating if and when payment for the articles or services requisitioned will be made. Should he not receive this notice within one month of handing in this requisition receipt note, he may apply again to the officer in command of the nearest British garrison, and request that the matter be enquired into.

No payment can be made under any circumstances whatever until this note has been handed in.

This note is merely a record of the transaction shown thereon.

ARMY FORM F 781.

APPENDIX III.

NOT NEGOTIABLE.

(No payment to be made on this form.)

ACKNOWLEDGMENT FOR REQUISITION RECEIPT NOTES FOR
GOODS AND SERVICES REQUISITIONED.

Received from (full title, name, &c.)

Address

Requisition Receipt Note No.....

Dated.....

Date

Signature

Commanding troops at

ARMY FORM F 788.

APPENDIX IV.

(a) BILLETING DEMAND ON CIVIL AUTHORITIES.

As an Officer of the British Army, I, acting under powers conferred upon me, hereby direct the Local Authorities of

to supply billets for :

Officers			Warrant Officers.	Staff Serjeants and Serjeants.	Rank and File.	Horses, &c.	Subsistence required. (Insert number of meals per day, number of days, &c. If no subsistence is required, insert the word "none.")
Generals.	Field Officers.	Captains and Lieutenants.					

⁴ In the event of subsistence being demanded and provided the question of payment therefor will be taken up on production of the requisition receipt notes, which must be transmitted to the officer in command of the nearest British garrison.

In case of any disobedience on the part of the inhabitants in complying with the demands, the Local Civil Authorities will address the undersigned without loss of time in order that military force may be applied if necessary.

Place

Date

Signature of Officer

ARMY FORM F 789.

(b) BILLETING ORDER ON INHABITANTS.

(Issued by the mayor, magistrate, chief police officer, or other local authority.)

Number of the Billeting Demand.....

(1) Quarters for—

Generals,
Field Officers,
Captains and Lieutenants,
Warrant Officers,
Staff Serjeants and Serjeants,
Rank and File,
Horses, &c.,

are to be provided, ⁵ together with subsistence as follows :—

by (Name) at No.
.....Street.

Place and date

Signature of Head of the
Community.

⁴ Alter as necessary if payment is to be made on the spot.

⁵ Strike out if no subsistence is to be provided.

APPENDIX III.

RECENT CHANGES IN THE INDIAN ARMY.

Extract from Indian Army Order No. 326 of 1911.—In continuation of India Army Order No. 203, dated 4th April, 1910, the following duties are transferred from the Adjutant-General's Staff to the Quartermaster-General's Staff in Appendix A-1 of that order :—

Dress.

Horses with units, horse shoeing.

The following duties are transferred from the Adjutant-General's Staff to the Ordnance Department :—

Patterns and scales of equipment for units (which includes all questions of inventions).

2. With the approval of the Secretary of State for India, Government have sanctioned, as an experimental measure, the formation of a reserve of 500 men for the Army Bearer Corps. The experiment is to be tried in the 2nd Division.

Indian Army Orders Nos. 471 and 592 of 1911 are given in full.

Indian Army Order No. 471. Appointments—Indian Army.—With reference to India Army Order No. 220, dated the 19th April, 1909, it is notified for information that, with the approval of the Right Honourable the Secretary of State for India, the Government of India have decided to discontinue the system of appointment of officers to the Indian Army from British units serving elsewhere than in India.

Indian Army Order No. 592.—Artillery Organization.—The Mountain Artillery allotted to the Field Army will in future be organized by brigades, each composed of two batteries.

These brigades will be numbered according to the division of the Field Army to which they are allotted, and the batteries told off to these divisions will, for the time being, form the units of the brigade.

2. Accordingly, brigades will be designated as follows :—

Designation.	For Batteries located at—
No. 1 Indian Mountain Artillery Brigade...	Abbottabad (i.e., the two batteries allotted to the 1st Division).
No. 2 British " " " " ...	Rawalpindi (i.e., the two batteries allotted to the 2nd Division).

Designation.	For Batteries located at—
No. 3 British Mountain Artillery Brigade	Jutogh.
No. 4 „ „ „ „ ...	Quetta (<i>i.e.</i> , the two batteries allotted to the 4th Division).
No. 5 Indian „ „ „ „ ...	Abbottabad (<i>i.e.</i> , the two batteries allotted to the 5th Division).
No. 6 British „ „ „ „ ...	Rawalpindi and Quetta (<i>i.e.</i> , the two batteries allotted to the 6th Division).
No. 7 Indian „ „ „ „ ...	Dehra Dun.

The next allotment of units to the Field Army will be amended to agree with the above.

3. In peace time the third battery stationed at Rawalpindi and that at Quetta will be under the command of the Lieutenant-Colonel Commanding the Mountain Artillery at each of those stations, as at present, in addition to the two batteries of the war brigade.

4. The Field Service Manual, Mountain Artillery, Section II, contains instructions for the completion of the Brigade Headquarters for mobilization, but it is not intended to complete the Headquarters during peace time.

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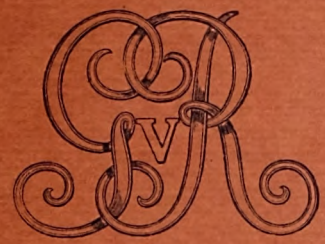
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NOTICE.

All communications should be addressed to

The Editor,

THE ARMY REVIEW,

War Office,

London, S.W.

Contributions may be sent in at any time, but if intended for insertion in the next number they should reach the Editor not later than six weeks before the date of publication of the REVIEW. The dates of publication are the 1st of January, April, July, and October.

MEMORANDUM.

ON taking over the onerous work of my distinguished predecessor, Field-Marshal Sir William Nicholson, I desire to urge upon the officers of the Army at home and abroad, in the interests of the higher professional education of the Army, that they should afford energetic support to THE ARMY-REVIEW, and that they should strive to increase its value to the forces of the Empire.

The general plan of this REVIEW, and the principles upon which it is conducted, have already been explained in the Army Council Letters of April 19th and December 19th, 1911, and in Sir William Nicholson's introduction to the first number.

When Lord Haldane placed at our disposal an organ for the expression of military opinion, he conferred a great benefit upon the Army, and a benefit also upon the public, which is frequently very ill-informed upon military matters. There were great difficulties in former days in front of officers on the Active List who had ideas and desired to express them. These obstacles have now been removed, and the pages of this REVIEW are open to all who have something worth saying, and some fund of experience to add to the common stock.

General Officers and Officers on the Staff in all parts of the world have special facilities for acquiring military knowledge, and are, therefore, expected to take a leading part in contributing to the pages of the REVIEW. The Army looks to them for light and leading, and it is their bounden duty to spare no pains to disseminate throughout the Army the results of their researches and experiences. THE ARMY REVIEW affords them a platform for this purpose, and I invite them to make good use of it.

But I do not look to General Officers and Staff Officers alone. This periodical is not exclusively a General Staff Organ. It is, as it is called, *THE ARMY REVIEW*, and it is so called because it is intended to appeal to all arms and services, to staff, departmental, and regimental officers alike. In the King's Army, with its wonderfully varied experience of men, things, seas, and cities in all parts of the world, the regimental officer has often as much to teach us and to tell us as the staff officer. The regimental officer is always in close contact with the rank and file, and I look to him, with his wide and practical experience, and his abounding sympathy with the men, to aid us in improving the teaching of the day.

To what extent should the doctrine established in our Regulations and Training Manuals guide contributors, and to what extent should free and independent expressions of thought, and new ideas, be accorded publicity? These questions are often asked, and the replies to them are supposed to be difficult. That is not my view. In my opinion, assuming even that our doctrine is only approximately sound, it is of incalculable benefit to the Army that all its leaders, and especially all its higher leaders, should act on the same inspiration, should be guided by identical principles, and should thus feel confident, no matter how difficult the situation, that their comrades, one and all, are inspired by the same governing considerations, and seek to attain by common action a common end.

No two battles, of course, are ever fought in precisely the same way, and no two military operations exactly resemble each other. We must avoid normal formations and take intelligence for our guiding star, but we must hold firmly to general principles and never forget them, infinite though may be the means by which we seek to apply them.

For the Commander-in-Chief of an army in the field it is indispensable for success that his lieutenants should be a band of brothers, firmly knit together in community of ideas, trusting one another, and all reposing loyal and unquestioning confidence in their chief. It was this splendid unanimity that rendered the Japanese unconquerable in their last war, though opposed by one

of the bravest and hardest-fighting armies in the world. If we could gain for ourselves experience by continuous wars, doctrine would be the outcome of experience in fighting alone, but in these days, when wars are less frequent, if more violent when they occur, it is in peace that our doctrine must be fashioned and taught, and according to our success or our failure in this duty will victory or defeat be due. Unless we are all firmly united in the bonds of a common doctrine, not imposed upon us from above so much as accepted by reason of its merits, we shall not be able to employ, to the greatest advantage of our country, the valour and the steadiness of our splendid troops.

So much for doctrine. But an Army which does not assimilate year by year, and even day by day, the latest discoveries and inventions of our marvellous age, and the latest fruits of ripe experience and intelligence, is bound to decline, absolutely and relatively. It is necessary that we should encourage, and not discourage, initiative and progress, wherever we find them, provided that they lead us in the right direction. Holding, as we must to succeed, common beliefs, we must still be catholic enough to encourage the expression of independent and original thought, and we must ever be ready to enfold all that is sound and useful in these new ideas within the four corners of our accepted doctrine. It is on these terms only that progress can be secured and stagnation be avoided. Doctrine remains doctrine even when it is progressive, enlightened, and receptive of good and new ideas. Between doctrine and dogma there is a wide gulf.

There are, I know, some officers who shun the fierce light of publicity from quite worthy motives, while there are others who are diffident in expressing views contrary to the manuals or to the opinions which leading generals are supposed to hold. To the first objection I wish to say that beliefs which shun the light are of no use to anybody. It is by publicity alone, and by the free play of argument and rejoinder, that wheat is separated from chaff, and that we garner our harvest of intellectual progress. As for the idea that originality of thought is discouraged, I wish to dispel all doubt by giving this statement a flat denial. All that I ask—and it is surely a reasonable enough request—is that ideas

which run counter to accepted doctrine should not be submitted without due reflection, should be supported by clear and logical reasoning, should be based on authentic facts taken from recent experience of war, should be expressed with restraint, and should avoid everything in the nature of recrimination and attacks upon individuals. Until such new ideas have been examined and have been embodied in the Regulations, it is the established doctrine that must guide us all.

I also desire to warn officers against pessimism, and against any depreciation of our forces and of our national strength. Politics are not matters for soldiers to dabble in, and with this side of our public life officers should have nothing whatever to do. Officers should regard the existing organization of our Army as a permanency, and should teach the public to regard it in this manner. Our sole duty is to make the best of our military resources, and not to trench upon ground reserved for the Government and the Legislature. Officers must give no countenance to ideas, as subversive of discipline as of confidence, which tend to spread doubt and despondency in the country concerning the solidity of its military institutions. They must, on the contrary, in close and ever cordial co-operation with their gallant comrades of the Navy, lose no opportunity of spreading abroad among the people a healthy confidence, which is the sure precursor of victory. Armed forces, imbued with whole-hearted belief in themselves and their cause, are unconquerable, even if inferior in numbers, whereas forces without this confidence are destined for defeat, no matter how strong.

To suggest subjects for contributors to the REVIEW would be to forget the saying of a great soldier-philosopher that the art of war extends with indeterminate limits in every direction.

The first four numbers of THE ARMY REVIEW are sufficient evidence of the truth of this saying. There is nothing in all the art and science of warfare that we can afford to neglect, and it is the duty of all officers who possess expert knowledge on special subjects not to keep it selfishly to themselves, but to produce it for the information of their comrades. I would lay particular stress upon the comradeship of the arms, and I invite

all contributors to pay very careful regard to it. It is the combination of arms that makes the army, and their co-operation which ensures victory.

If there be one subject more than any other upon which light is required, it is the art of generalship and of the higher leading of troops. To obtain more rapid progress in this art I invite officers to make studies of campaigns, preferably the latest, and of special episodes of them. They will thereby teach themselves while teaching others, and the best military history is that which illumines the future by the light of the past. Studies of the work of staffs of brigades and divisions on the march, in billets, and in battle, are also to be desired, and I look to the General Staff at Headquarters to keep the Army fully posted in military literature at home and abroad, and in the changes and tendencies of foreign armies. Last of all, I ask officers to remember the links which unite us indissolubly with our brothers-in-arms in the great self-governing Dominions, the Crown Colonies, and India ; to lose no opportunity of helping our comrades in the development of their military strength ; and to act as missionaries of Imperial ideals.

If every officer who reads these lines holds firmly to the rules of conduct which I have endeavoured to trace, I have no doubt that, at the end of his career, he will feel that he has not lived in vain, and that by his fruitful labour he has contributed the share of a man to the greatness and prosperity of the British Empire.

J. D. P. FRENCH.

C.I.G.S.

March 15, 1912.

I.

FINAL ADDRESS TO THE OFFICERS OF THE SENIOR DIVISION, STAFF COLLEGE.¹

By MAJOR-GENERAL W. R. ROBERTSON, C.V.O., C.B., D.S.O.,
Commandant, Staff College.

I HAVE so little that is new to say to you to-day that at first it hardly seemed worth while holding this meeting, but on consideration I decided to hold it because, although there may be nothing very original to tell you, some of the old things will well bear repetition.

I am in the happy position to-day of not being required to criticise your work. I have seemed to do nothing but criticise since I first knew you, and frequently, after addressing you and returning to my own room, I have felt that I have said too little about the good work you have done, and perhaps too much about the work that was not so good. But of course that had to be so. It was of no use devoting our time to work with which there was little or nothing to find fault; it was necessary to give all available time to correcting what did not seem to be right. I desire therefore to take advantage of this opportunity to say that I do appreciate the excellent work you have done, and I wish you to accept the many criticisms I have made in the spirit they were intended, namely, to help you.

During your course here much attention has been paid to instruction in staff duties. Some of you may think a little too much. But I do not. This is the Staff College, and our first business is to teach staff duties, and, as far as it is possible to do so without actual practice, send you away ready to take up any staff appointment suitable to your rank and experience which you may now any day be selected to fill. For, becoming proficient in the higher and more important duties of command, you have still much time in front of you, and what we have aimed at in this respect is to give you a sound foundation upon which you can build after you leave, and so eventually acquire those many and varied attainments which are essential to efficient command. Also, experience on the staff is of itself a good

¹ December 20th, 1911.

and requisite apprenticeship for command. An officer who has never served outside his regiment must, when called upon to fill a General's appointment, frequently find himself in a difficult position which a little previous experience on the staff would have obviated.

Having acquired a theoretical knowledge of staff duties, you should, from this time forward, turn your thoughts to the practical application of it. Comparatively speaking, it is quite an easy matter to amass a certain amount of knowledge; it is difficult to apply that knowledge in practice. The errors you may have committed here when carrying out staff duties have had no more serious effect than to subject your work to additional criticisms by the Directing Staff. When you leave, and have to perform these duties in a practical manner, the result of a mistake may be considerable even in peace, and in war may be very far-reaching indeed. Therefore you should begin at once to think deeply over the application of what you have learned. You have on different occasions been asked to deal with a variety of subjects, and sometimes have had to do in a few days what in reality you might have been given weeks to do. This had to be so because we could not devote full time to each of the many questions it was desirable to consider, and the result perhaps is that what you have learned has not yet been thoroughly digested and put into working order.

On taking up a staff appointment your first object must be to obtain the confidence of your Chief, and you might do worse than begin by remembering that you yourself are not the Chief, but the Chief's agent and assistant. The extent to which he will trust you will depend largely upon yourself. Most of us know people who have the reputation of wishing to do everything themselves, but even such people are, according to my experience, quite ready to leave their subordinates to do their own work more or less in their own way as soon as those subordinates show that they can be trusted.

Learn to take "No" for an answer. The business of a staff officer is to put a case as it arises fully before his General, and to make appropriate and practical suggestions for dealing with it. The General then decides, and when he has done that, it is for the staff officer whole-heartedly to devote his efforts to carrying out the decision, whether it is in accordance with his suggestions or is opposed to them. Upon the General rests the responsibility, and, therefore, with him must rest the decision. Nothing is more annoying than for a staff officer to keep harking back to some suggestion he may have made, after the General has fully considered it and decided not to adopt it. You should not feel hurt or displeased if your General sometimes does this, nor should you allow the fact to deter you from putting forward necessary suggestions in future. Remember, he may have good reasons for acting otherwise than you think he should, which he may not have the inclination, time, or power to explain to you.

If you are appointed to do work in an office, say in the War Office or at the Headquarters of a Command, do not expect to be at once asked to deal with the most important problems. They will be dealt with by officers senior to you and of wider experience, and your first duty will probably be to collect and sift data for the use of someone else. Do not be disappointed at this. Some officer must do this class of work, and for obvious reasons it usually devolves upon the newest comer. Your turn to deal with the more important work will come later, and it will probably come all the quicker if you display the requisite ability and assiduity in carrying out this elementary and seemingly menial duty.

With respect to office work in general, be careful to keep your pen well under control. More trouble is caused in an office by pen and paper than by anything else. As far as possible, do your work verbally when dealing with complicated questions which have to be discussed with another branch, afterwards committing the result of your discussion to paper as far as this may be required for record and other purposes. Much time will be saved thereby. Also, be careful to mind your own business, and avoid interfering with that of other branches. This is a recognized rule of office etiquette, and when it is broken there is apt to be trouble. You have no right to interfere with the work of another branch, and probably no good, but much harm, will result from doing so, because, as a rule, you will not know enough about the work of that branch.

Another word of advice I would give about office work pure and simple is, do not try to remain in an office a day longer than the ordinary tenure of your appointment, but get back to troops. A certain amount of office work is an essential part of your education, but it is nevertheless true that if you remain in an office unduly long your physical condition will suffer, your eye will get out as regards distance and ground, and you may become unpractical in regard to what troops can do as well as insufficiently sympathetic towards them. As I have many times told you, we exist for one purpose only, namely, war, and, except in the case of quite a few individuals, war is a business that is conducted out-of-doors, not in an office.

With respect to the training of troops, be on your guard against the insidious and detrimental effects of peace. The longer peace continues the more difficult it is to prepare for war, for the usages of peace have a habit of pushing themselves more and more into prominence, until they assume the appearance of war conditions, and begin to be regarded as such. There is naturally a wide divergence of opinion as to what is suitable for war, and war alone can decide which conception is the true one. Guidance can, however, be obtained from a close study of military history, and from peace exercises based on the fundamental principles of war. You must frequently pull

yourselves together, as it were, and try to ascertain whether you are or are not adhering to these principles.

Musketry is an important part of your duties. I refer to the application of fire. The staff do not always pay adequate attention to it, nor see that units carry out their field practices to the full extent. I know there are many difficulties to surmount, but still staff officers should be particularly alert in regard to this part of the training of troops for war. Training-grant money spent on musketry of a practical nature is well spent.

Do not forget what I have often told you—and I am thinking now not of an office but of work out-of-doors—that you must always be looking ahead. Whenever I see during field operations a group of staff officers collected together chatting, smoking, and taking little or no notice of what is happening around them, I have no doubt in my own mind that they are neglecting their duty. I have had some experience of service on the staff, and when troops have been on the move I have seldom found time in which to be idle, and even if there be such, it is not right to take advantage of it under the eyes of the troops who may be passing you, perhaps hungry, thirsty, and exhausted.

A staff officer should carry in his head all general information regarding the army with which he is serving, the composition and distribution of the adjacent larger formations so far as he ought to know them, the distribution and strength of all his own units, and the names of their commanding officers. He should be able to answer any question his General may ask him at any time. If he cannot do that he fails in his duty, and he cannot do it unless he is constantly looking ahead. He must think over all possible alternatives of action, and be ready to issue the requisite orders according to the particular alternative his Chief may at any moment select, and it is because of the amount of forethought required, and the necessity for taking many preliminary measures, that I am convinced staff officers have no time during operations for the chatting and smoking to which I have just referred. They can, of course, "carry on," and write such orders as their General may give them, but that is not one tithe of their duty. They must be prepared to answer any question, to take instant action in any situation, to foresee and prevent difficulties, and they cannot do these things unless their whole mind is directed to their work and to that alone.

If troops are not in their proper place at the appointed time, or are not complete, fully equipped, and supplied in all respects as far as it is possible for them to be, the fault lies with the staff. There is no need for the staff to interfere with the execution of details, but it is for them to ensure that the right thing is done, and done at the right time. You must not take it too much for granted that the troops will necessarily do what your General wishes them to do as

notified in orders. You must see that they do it, and this you ensure by observing, watching, and inquiring, before matters have time to go wrong.

The fatigue and privations of war, sickness, and wounds, soon make serious gaps in the ranks of regiments, and the abler the staff the stronger will be the regiments in the day of battle, for if the arrangements have been good, the men will have been spared all unnecessary exertion, and will have been cared for in every way.

In action staff officers should be all eyes and ears. Your field glasses must be used without intermission, and anything remarkable should at once be reported to your superior.

I hope that I need not remind you to be on all occasions absolutely loyal and honest towards your General. I have known staff officers who have not always been what I regard as strictly honest in the opinions they have given their General. For example, in trying to put a cheerful aspect on matters, I have known them endeavour to persuade him that things were better than they themselves knew them to be. I cannot say that I agree with this. I would wish my staff to be absolutely straight, and not mislead me.

Remember, too, as I have already said, that the staff officer is not the General. Staff officers communicate orders to others in the name of the General, and, although in practice they may have much in their power, they must be careful to prevent it from becoming generally known. Orders will never be properly obeyed, especially by a good and strong commander, if they are known to emanate from the staff alone and not from the General. The staff officer cannot do the work of the General and produce the best results any more than the General can do the work of the staff officer and at the same time do his own. Your commander must never be ignored even though you may disagree with his action. It is not merely that you injure the individual when you neglect to comply, readily and unreservedly, with his orders, but you deprive him of that confidence which, for the public good, it is essential he should possess.

When conveying messages under fire, try to be cool to the utmost extent. If by nature an officer is excitable, he should place a strong curb on his manner. Verbal reports should be almost impassive in the style in which they are made, and the officer making them should always look as jolly and unconcerned as if engaged on an ordinary field day.

In conveying a verbal order you cannot be too particular to ascertain before you start what the exact intention of your General is, and be careful that you communicate it in a clear and intelligent way, throwing full light upon the spirit of it. Should the recipient be dull in catching its real meaning, or if he seems inclined not to obey, you must be respectfully firm in insisting on the order being carried out in the way your Chief wishes it, and if you think the

recipient has no intention of doing this, lose no time in informing your commander.

When dealing with superior officers be most respectful in your manner, remembering that you are but the agent of the General. A staff officer should feel bound by his position to treat everyone with the courtesy due from one gentleman to another. By doing this he will give his General great assistance, and, by omitting to do it, he may be the cause of incalculable harm.

Reticence is another virtue that needs to be constantly practiced. Most of us have seen the staff officer who goes about in such a way as to give the impression to the outside world that he is oppressed with hard work, is in possession of the greatest secrets, and knows every movement that is to take place. This is not only foolish but wrong. It is foolish, because if the outside world does not believe it, they will laugh at you; and it is wrong, because if the impression is credited, it is nearly as bad as if you revealed the secrets. It is best to profess entire ignorance regarding such coming events as your Chief wishes to be kept secret, and if officers try to pump you, you should parry their questions and lead them to believe that you cannot answer them because you do not know. I do not mean by this that you should be exclusive in your acquaintances. Quite the contrary. You should mix freely with regimental officers, as it is desirable your General should know every camp rumour, and the opinions of the rank and file of the Army as to the course of events and the actors in them.

Staff duties as a whole mean hard work. In these days there is no time for amusement beyond what is needed for the preservation of good health, and officers who are not prepared to accept staff employment on these conditions ought not to accept it at all.

To sum up, I would say that, when serving on the staff, you should endeavour to cause your General to regard you as his most loyal and competent assistant and adviser; and you should devote your energies to inducing the regimental officers to regard you as their best friend, who is always ready and willing to help them in their difficulties. Remember that their difficulties are considerable, that they loom up very large in the eyes of the regiment, and that the regimental officer has not the same compensating advantages for the hardships of war as the staff officer has.

A few words now with respect to the duties of command. I need not enlarge on the fact that it is impossible properly to perform these duties without constant study and deep reflection beforehand. Doubtless there are in our Army, as in all others, men to whom a little knowledge is a dangerous thing, and who, in moments requiring promptness, will begin to theorise instead of to act. Such men may amass a great amount of knowledge, but are incapable of properly

applying it, and this is usually so because they unduly subordinate their action to their book knowledge. But these are exceptions we may hope, and although the higher qualifications for command can never be learnt solely from books, it is still true that he who is endowed by nature with the requisite mental and physical power can undoubtedly improve his ability 100 per cent. by careful study.

Do not forget what I have frequently said about the value and culture of an intelligent and appropriate initiative. When you become commanders, and expect your subordinates to exercise a due amount of this quality, you must be prepared to see them do things sometimes not quite according to your wishes. You cannot have it both ways. You cannot expect proper initiative to be displayed if, at the same time, you are constantly interfering in matters of detail. So long as principles are being correctly observed you must leave the details to your subordinates. Initiative is a very sensitive thing and is easily checked; consequently, you must be careful not to do anything which would unduly interfere with it.

In making strategical and tactical plans do not forget that the enemy may be just as afraid of you as you may have cause to be afraid of him. I was a little disappointed a few days ago in watching some of you engaged in a tactical exercise. I listened to some verbally describing the situation and giving their ideas as to how they proposed to meet it, and I noticed that they paid much more attention to what the enemy might do than to what they themselves wished to do. Of course, full consideration must be given to the probable plans of the enemy, but do not put these in absolutely the first place, and what you yourself desire to achieve in the second place, or you may, perhaps quite unconsciously, surrender the initiative to him. While carefully considering what the enemy may do to thwart your object, always keep that object in the forefront of your meditations.

In action a commander should avoid all fuss and hurry. He should give his orders and then calmly await their execution. His mind should be clear and cool at every phase of the action, so that he may be able to grasp the real condition of affairs, and thus be in a position to decide quickly what steps should be taken. He cannot do any of these things if he is galloping fussily about from place to place.

Do not forget what we were talking about the other day, namely, our "doctrine" in regard to the battle. It is to be found in the first line of the first paragraph in the chapter in Field Service Regulations dealing with the battle. Go for your man as soon as you can. There is no necessity to come to the Staff College in order to learn that only by the offensive can you win. That is obvious to everybody. But going for your man does not justify making a mere blind rush at him. Of what use is the study of the science of

war if, when battle comes, you throw it all to the winds and rush straight on your enemy as if you knew nothing of this science? Still, I repeat, go for your man, for it is only by so doing that you can win.

In this connection remember that the knowledge you have acquired here is only a means to an end; it is not the end. You do not necessarily win battles by being "based on an arc," or by having "liberty to manœuvre," or by being on "interior lines," or by being in possession of any of these or other high-sounding things. There is only one way, ultimately, of winning a battle, and that is by fighting, hard fighting, and that is why both commander and staff should devote their constant attention to all those matters which tend to increase the fighting-power of the troops.

Another word of advice to you is, whether you are on the staff or in command, endeavour by your example to create a good standard of discipline and respect for superior authority. I fear that in these days there is apt to be some slackness in this respect. Discipline is the only thing, or rather the chief thing, which differentiates between an army and a mob. It is the result of constant and careful attention, and can never be produced on the spur of the moment.

That, gentlemen, is about all I have to say. I hope and believe that the result of the labours of the Directing Staff here will be to send you forth to-morrow full of confidence, and feeling capable of executing the work which lies before you. That work will be strenuous if you are to increase, or even maintain, your efficiency. So far as one can judge from the present state of the world, you may any day find yourselves taking part in a war than which there has been no greater for the last 100 years or so, and it may be upon *you* to whom I am now speaking that to a great extent will depend how we emerge from that war. We are too apt to go on day-by-day discussing the probability and consequences of certain wars, without ever really recognizing our own individual responsibility, and remember that officers who have been through the Staff College have the greater responsibility. You do not come here merely for the sake of passing certain examinations at the end of the first year, and of obtaining a P.S.C. at the end of the second. You come here in order that you may leave the College a better and more efficient member of the military community. You should now endeavour to increase the knowledge you have acquired, disseminate it amongst others, and, as I have often told you, direct your studies and peace preparations in general to a special and definite end—that of *fighting* the most probable and formidable adversary for the time being. Finally, remember that when the day for fighting comes, the qualifications demanded of you, whether on the staff or in command, will include, in addition to a good theoretical knowledge of your professional duties, the possession of a quick eye, a good digestion, an untiring activity, a determination to close with your enemy, and a firm resolution not to take counsel of your fears.

II.

THE FRENCH FIELD ARTILLERY.

OBJECT OF THIS PAPER.

SINCE its adoption in 1897 of the 75 mm. equipment, the French artillery has been a source of deep interest to every Military Power. While in some quarters there was at first a tendency to disparage the merits of the new *matériel* and the new principles of organization and employment introduced in its train, France can to-day justly claim that, in the matter of artillery, she has set the fashion to all Europe, which has been compelled to follow in the path that she was the first to mark out.

In the British Army, interest in the French equipment and methods of employment has steadily grown in proportion as acquaintance with them has increased. Recently, in particular, several officers have been privileged to watch the French artillery actually at work, and have enjoyed special facilities at French practice camps and schools of instruction for studying questions of equipment, organization, training, and tactical employment. An outline of the valuable experience thus gained forms the subject of this paper, which has been prepared with the object of dissipating certain misconceptions that have arisen, and in order to stimulate thought in the direction of possible improvements in our own artillery service.

PART I.—EQUIPMENT.

ESSENTIAL CHARACTERISTICS OF THE FRENCH EQUIPMENT.

In studying the French artillery it is necessary for several reasons to begin by forming a clear idea of the chief characteristics of the equipment. For, in the first place, it is from the essential properties of their *matériel* that the French have deduced, not only their organization, but their methods of fire and principles of employment. On the basis of its possibilities and limitations they have built up, after long experience, a coherent system, which is logically and consistently designed to exploit the full powers of a true quick-firer.

Moreover, in the face of the unanimous reports of British officers, there is no longer any room for doubt but that the French equipment

and ammunition is still in many respects superior to our own, notwithstanding the fact that it dates from 1897.

The essential characteristics of the French gun and its equipment are :

- (i) Great rapidity of fire.
- (ii) Accuracy.
- (iii) Facilities for indirect laying and manipulation of lines of fire.
- (iv) Power of a single gun effectively to cover a wide front.

(i) *Rapidity of fire.*

The most striking feature of the 75 mm. gun is the extreme rapidity of fire of which it is capable. On the evidence of numerous carefully-timed records it is beyond question that a rate of fire of from 20 to 30 rounds per gun per minute can be maintained, and this not by picked men, but by ordinary detachments, composed for the most part of men in their first year of service. It has been calculated by an officer, whose technical experience at our own practice camps makes him well qualified to judge, that the French gun is capable of firing five accurately-laid rounds to every three of our 18-pr. Thus, a French battery can develop a greater volume of aimed fire in a given time from its four guns than a British battery can produce from six.

It is instructive to glance at some of the factors of this phenomenal rapidity of fire, which may be attributed generally to three things, namely, the steadiness of the gun and carriage on firing, the facilities for setting fuzes, and the facilities for loading.

“ *Abatage.* ”

The great steadiness of the carriage is primarily ensured by the device of *abatage*, or anchoring. This consists in an arrangement of drag shoes united by connecting rods, one shoe being applied to each wheel. When the gun is limbered up, or if it is not desired to anchor the carriage, these shoes are raised by means of a lever to a position similar to that of a travelling brake. But when the gun is in action, the lever releases both shoes, which drop to the level of the ground. The trail is then lifted shoulder high, and by that action engages a ratchet on the axle-tree; when the trail is again lowered, the action of the ratchet levers both gun wheels right on to the drag shoes, which are then vertically under the naves and hold the wheels firmly.

The under sides of the drag shoes are furnished with small projections which bite the ground; thus, after the first round has been fired, the carriage is held fast at all three points of contact with the ground, viz., the spade at the point of the trail, and the drag shoes under each wheel. To disengage the shoes when anchored, the wheels are manned forward. This has to be done at every switch that is beyond the com-

pass of the traverse—and the time taken to re-anchor the gun on such occasions is a disadvantage. But the few seconds required for the operation are more than regained in the greater rate of fire thus obtainable.

The gun can, if required, be fired unanchored, but the carriage is then not so steady, and the trail buries itself deeply in the ground. The rate of fire with the carriage unanchored is only about two-thirds of that achieved when anchored.

System of traverse.

The system by which the gun is traversed also contributes to steadiness. In our own equipment the gun pivots on the axle-tree, consequently, at any angle approaching extreme lateral traverse, the force of recoil tends to produce a turning movement of the whole carriage round the point of the trail, as the line in which the gun recoils does not pass through the point of the trail, but to one side of it. The French gun, on the other hand, is made to traverse by the whole top carriage, which carries cradle and gun, sliding laterally along the axle-tree of the carriage in response to the motion of the traversing wheel. An arrangement is provided by which the axle-tree of the carriage can turn slightly, so as to remain constantly at right-angles to the axis of the top carriage and cradle. Thus the gun really pivots round the point of the trail, and always recoils straight towards it, so that there is no turning movement, and the carriage remains steady at any degree of traverse. The extent of traverse is about $5\frac{1}{2}$ degrees.

Buffer.

The smooth and gentle action of the recoil buffer conduces still further to steadiness. The secret of this buffer has been well kept, and to this day it is probably superior in efficiency to that of any other equipment. The combination of the steady carriage and smooth recoil results in the return of the gun after every round to what is, for all practical purposes, the same position. Thus no time has to be spent in relaying.

Automatic fuze-setter.

The second factor of rapidity is the *débouchoir*, or automatic fuze-setting machine, which permits fuzes to be accurately set even faster than they can be loaded and fired. The contrast between this machine and our own appliances is so striking that a short description of it will not be out of place, although, doubtless, it is already familiar to many readers of this REVIEW.

The *débouchoir* is, in appearance, an oblong metal box, about 15 ins. long by 8 or 9 ins. broad and 6 ins. high. It lets down from the rear of the ammunition wagon in action, and rests flat on the ground.

On the upper face of the machine as it rests on the ground are two sockets and a large dial. Into each socket a shell is placed, fuze downwards, as described below. On the dial is marked a range scale in big, bold figures, easily read at a distance of several feet, the graduations being large and unmistakeable. An index finger is centred on the dial which can thereby be set to any required range. A corrector scale is fitted to the dial, and this also is easy to read and to set. At each side of the machine is a lever, which, when pressed down, actuates a horizontal punch in the interior of the box.

The time composition in the fuze is arranged spirally, like a screw-thread, round the outside of that portion of the fuze which projects from the shell. On this portion of the fuze there is also a small projection, or feather. In placing the shell in the socket of the *débouchoir* it is slightly turned till the feather on the fuze engages with a featherway in the wall of the socket, thus allowing the head of the shell to go "home" with a click. The action of setting the range dial regulates the position of the featherway in the socket, and thus alters the position of the fuze relatively to the head of the horizontal punch.

The process of fuze setting thus resolves itself into three very simple actions :

- (a) Placing the shells in the socket.
- (b) Setting the range dial and corrector scale.
- (c) Pressing down the levers, which thus punch the fuze at the required graduation.

Three men are employed in this process, kneeling behind the wagon ; two men keep the sockets filled with shell, passing the latter when set to the loading number ; the third man sets dial and corrector, and operates the levers.

Compared to the ease and simplicity of working the *débouchoir*, with its bold figures and graduations, the process of setting our minutely divided fuzes by hand is crude and ineffective in the extreme.

The wonder is not that the French artillerymen are able so easily to out-distance us in rapidity and accuracy, but that our own gunners can accomplish what they do when handicapped so heavily by the shortcomings of their equipment.

Facility of loading.

The third feature of the equipment which makes for speed is the general ease with which the gun can be loaded and fired. There is no awkward metal guard as in our own gun, extending backward between the breech and the loading number, consequently the latter can get at the breech more easily. The breech action, which is actuated by a large crank handle extending to the rear, parallel to the axis of the bore, is more easily opened and shut than that of the 18-pr., a simple

blow with the flat of the hand sufficing to open it. In our case, it is not at all an easy thing for No. 2 to get hold of the breech handle until the gun has almost returned to the firing position, and there is always a danger of his fingers getting caught by the guard previously mentioned. With any ordinary French detachment, on the contrary, the breech is opened before the gun has fully recoiled, and the latter is often reloaded almost before it has finished running up. This is facilitated by the gentle action of the buffer, which works more smoothly and less violently than that of the 18-pr. A very powerful and efficient ejector further contributes to rapidity in reloading—the empty case is generally thrown clear of the trail eye.

(ii) *Accuracy.*

The remarkable accuracy exhibited by the 75 mm. may be ascribed on the one hand to its high muzzle velocity and consequently flat trajectory, on the other hand, to the excellence of the fuzes which burn most regularly and respond to the corrector in a consistently satisfactory manner.

The flat trajectory is specially valuable in firing for direct hits against *matériel*, such as guns and wagons, walls or structures of all kinds. Full use is made of this property by the use of high explosive shell, a proportion of which is carried by every battery, and highly gratifying results are achieved by its use. On the other hand the flat trajectory has the disadvantage of adding considerably to the difficulty of firing from behind cover, owing to the increased danger of the trajectory not clearing the crest (see page 310).

(iii) *Facilities for indirect laying.*

The sighting arrangements of the 75 mm. are, to some extent, similar to those of our own gun in that they comprise the independent line of sight. That is to say, the elevation due to the range is given by one man setting a range dial on the right side of the gun, while the elevation or depression corresponding to the angle of sight is given by the layer with the sight clinometer on the left of the gun.

It may here be noted that with the 75 mm. equipment the French adopted a new system of angular notation. The unit of measurement, both for horizontal and vertical angles, is the *millième*, which is, strictly speaking, the $\frac{1}{1000}$ th part of a right angle, or about 3.3 minutes. But, as its name implies, the *millième* is for all practical purposes equivalent to an angle of $\frac{1}{1000}$, and the advantages of this system will be readily understood. It is especially convenient for calculating the extent of front subtended by angles of deflection or *vice versâ*. For an angle of one *millième* at a range of 1,000 metres subtends 1 metre, thus 100 *millièmes* at 4,000 metres range subtend 400 metres, and so on.

This notation greatly facilitates calculations for concentration, distribution, and sweeping (see page 314).

The actual sight, called the *collimateur*, is an optical arrangement which practically combines tangent sight and foresight in one. The layer, on looking through it, sees the image of a white cross reflected at an infinite distance in front, and lays the gun by getting this cross on to the target. As a matter of fact the French now scarcely ever use direct laying, so that the *collimateur* is only used for laying for direction on an aiming point or another gun when laying out lines of fire. The arrangements for this are as follows:—

The *collimateur* is carried on top of a vertical pillar which stands on a graduated base plate (*plateau*) attached to the left trunnion of the cradle. The pillar can revolve on the base plate round its vertical axis, and has an index mark at the bottom by which the graduation on the base plate can be read. This shows the horizontal angle between the axis of the piece and the line of sight, reading zero when the latter is parallel to the gun. Each division of the *plateau* is equivalent to 200 *millièmes*. A micrometer screw (*tambour*) is also provided for fine adjustment, reading to one *millième*.

The sight clinometer is in principle similar to that of the 18-pr., but graduated in *millièmes*. A further advantage of the *millième* notation is the ease with which angles of sight can be found from any map on the metric system; for the difference of level between two points, in metres, divided by the number of thousands of metres in the range, gives the angle of sight in *millièmes*.

The superiority of the French pillar sight, attached to the mounting of the gun and moving with it, compared to the 18-pr. dial sight fixed to the shield, is very marked. Switches can be rapidly and accurately made, while the steadiness of the carriage enables aiming posts to be dispensed with. Thus the lines of fire can be manipulated with ease and confidence, with the result that firing from behind cover is robbed of half its difficulty.

(iv) *Power of a single gun to cover a wide front.*

The foregoing characteristics of the equipment combine to endow each individual gun with immense power. This power is exploited to the utmost by the process of sweeping (see page 314), which the French habitually employ in order to cover a considerable extent of front with each gun. The smooth and regular working of the axial traversing motion described above, aided by the steadiness of the carriage, enables sweeping fire to be more accurate and effective than it usually is with the 18-pr. In this manner the French are able to deal with any ordinary situation with a comparatively small number of guns, keeping the rest in hand for further developments.

MISCELLANEOUS ITEMS.

Range-finders.

No range-finders are at present issued to batteries, but various instruments of the one-man pattern are understood to be under trial. Should a satisfactory pattern be adopted, it will add still more to the advantages of the French system of ranging (see page 313). For at medium ranges it should be possible to produce some effect even with the first ranging rounds.

Angle of sight instruments.

No regulation pattern angle of sight instrument has yet been approved. Various patterns of pocket clinometers are in use by officers who obtain them privately.

Observation ladder.

The up-ended ammunition wagon perch is the commonest form of observation ladder, and is useful in a rough and ready way. A light, four-wheeled, two-horsed vehicle, carrying a ladder which can be wound up to the observing position, is under trial, and appears likely to prove satisfactory. The want of communications (see page 310) makes the question of an observing ladder specially urgent.

PART II.—ORGANIZATION.

CONSIDERATIONS AFFECTING THE FRENCH ORGANIZATION.

Having adopted a true quick-firing gun, the French devised an organization that would give full scope to its powers. Recognizing that with modern quick-firers a battery of six guns was too large a fire unit for the average man to handle in such a manner as to realize the full possibilities of the equipment, the French adopted a four-gun battery organization. At the time when the 75 mm. was introduced (1897-98), it was so far in advance of the weapons possessed by any other Power, that it was reasonable to assume that the greater efficiency of the new gun could compensate for inferiority in numbers. So, for some years, French artillery establishments were framed in accordance with that principle, and the number of guns per Army Corps was considerably less than in other armies. But when, in the course of time, the other military Powers re-armed with quick-firers, approximating in efficiency to the 75 mm., the French were faced with the necessity of increasing the number of their guns. This could be done either by adding two guns to each existing battery, or by keeping the four-gun battery organization and creating more batteries. It is instructive to note that, in spite of the many and obvious advantages from the

administrative and financial point of view of the former course, the French adhered to their four-gun organization, and increased the number of batteries, of which there are now 30 in each Army Corps. In addition to these a certain number of *batteries de renforcement* are formed on mobilization.

Arguments in favour of four-gun batteries.

There can be little doubt that the French artillery were justified in holding out for their four-gun batteries, apart from the fact that a reversion to the six-gun unit would have entailed a re-casting of their drill and methods of fire. In the first place, it has come to be recognized that if artillery are not to run the risk of losing all mobility, and of being pinned to the ground by hostile artillery fire, the guns must, in the earlier stages of the action at least, occupy concealed positions, *i.e.*, usually behind the crest. Now the mental effort required to manipulate the fire of six modern quick-firers behind cover, in such a manner as to deal successfully with any tactical situation that may arise, and, at the same time, to get full value out of the gun, is beyond the power of the *average* battery commander. This is especially the case in dealing with movement, that is either in supporting the forward movement of one's own troops or preventing that of the enemy. Secondly, the physical limitations to the power of making the voice heard are such that in a six-gun battery orders must, to a certain extent, be passed, thus necessitating a more complicated and slower form of drill and procedure than can be adopted in a four-gun battery, where the battery commander's (or battery leader's) orders can be heard as a rule by all four guns simultaneously.

Then again, the difficulty of finding a suitable covered position for six guns is much greater than when only four emplacements have to be found. In the case of the French, this difficulty would have been aggravated on the one hand by the flat trajectory of their gun, which makes it necessary for the position to be near the crest in order to clear it; on the other hand, by the absence of any reliable methods of communication except passing orders by word of mouth, which necessitates the battery commander's observing station being close to the battery. In these circumstances, to reconcile the conflicting demands of adequate cover and facility of command is difficult enough, even with four guns; it would be practically impossible with six-gun batteries.

It results, from the above considerations, that the four-gun battery is relatively a far more efficient fire unit than the battery of six guns. For the ease of control and simplicity of drill and procedure that is possible with the smaller unit, added to the accuracy, rapidity of fire, and "reach"¹ of the French gun, enables one of their four-gun batteries confidently to engage a larger fire unit.

¹ *i.e.*, the power of covering a wide front.

The smaller numbers required in the firing line release more personnel and horses for the pressing requirements of ammunition supply. This question, indeed, may be said to clinch the whole matter. For it is out of the question to keep even two guns per battery, much less six, sufficiently supplied with ammunition to enable them to fire continuously for any length of time. Therefore, during a considerable portion of the day, the personnel, horses, and *matériel* are standing inactive, though exposed to fire themselves. Is it not, therefore, more logical to use all the ammunition that can be supplied in a machine that will produce as good, or even better, effect in a shorter time with less risk of error, less exposure of personnel, and less inconvenience to other troops; that is to say, in a four-gun rather than a six-gun battery?

Arguments against the four-gun organization.

It has been advanced as an argument against the four-gun organization that, given the same number of guns in each case, the superior control and direction of a larger number of four-gun batteries will be more difficult than that of a smaller number of six-gun units. Also, that it will be more difficult to find the increased number of observing stations when firing from behind cover. In answer to this it is submitted that the bedrock of military efficiency is the efficiency of the unit. Any organization built up from relatively more efficient fire units must be better than one composed of units less efficient. The higher control and direction must be organized to that end, and adapted to deal with the number of units required. Similarly, if only a certain number of fire units can be fitted into a certain portion of the front, it is better to use only that number, and work them to their full capacity, than to crowd in a larger number of guns than it is possible to use to the best advantage. The remainder are better kept in hand, either to extend the front in other directions, or to meet the unforeseen, or to relieve units that have come to the end of their ammunition or their endurance. The last point is one that assuredly demands attention. In the protracted struggles that are characteristic of modern war the physical endurance of artillery, as of other troops, is only human; apart from heavy casualties, it is not to be expected that the strain of continual firing, which, with modern guns, is very severe, can be supported for many hours at a stretch without considerable loss of efficiency.

Establishments of French artillery Commanders and Staff.

In the case of the French, these considerations have been fully thought out and acted upon. To meet the difficulty of controlling a comparatively larger number of fire units, their establishments of higher artillery commanders and staffs are on a more liberal scale

than our own, and more highly organized. While they attach less importance than we do to mechanical methods of communication, and prefer to substitute for that means of control a larger measure of responsibility to subordinates in carrying out assigned tasks, they lay great stress on personal communication by officers or specially selected and trained N.C.O.'s. Throughout the entire military hierarchy every subordinate commander is made responsible for establishing and maintaining touch in this manner with his immediate superior.

The artillery of the Army Corps is divided into three regiments: two of these are divisional regiments, each composed of three *groupes*, each of three batteries, while the third is the Corps artillery regiment, and comprises four *groupes*, each of three batteries. The whole is under the command of the G.O.C., R.A., who has on his staff three officers for communication purposes in addition to an administrative officer. Each divisional or Corps regiment is commanded by a colonel, who has a lieutenant-colonel as second in command, in addition to a captain and three orderly officers at his disposal. Similarly, each *groupe* commander, who is a major, has three subaltern officers for communication.

With regard to the second objection, that of the increased number of observing stations involved by the four-gun organization, the French are not embarrassed by this difficulty, as they do not contemplate the use of observing stations at a distance from their batteries (see page 310). Consequently, the space required to allow for the danger angle between batteries is not greater than is found to be available under ordinary conditions of ground.

PART III.—DRILL, FIRE-DISCIPLINE, AND METHODS OF FIRE.

THE NEW FRENCH ARTILLERY REGULATIONS.

The recent opportunities afforded to our officers were all the more valuable, as the experience gained embodied the teaching of the new French Artillery Regulations, which were approved in September, 1910. In this edition, Section V, which deals with gun drill and fire discipline, methods of fire, and application of fire, has been completely recast. The 1903 edition, which was practically the same in this respect as the original issue of 1898, legislated chiefly for positions in the open, from which the lines of fire were obtained either by direct laying, each gun taking its corresponding portion of the target, or by means of an aiming point not far removed from the target itself.

Since then, positions behind cover have become the rule, consequently, the lines of fire have now to be obtained by other means, as described later (see page 311). Also, the reorganization of the artillery

has been effected, and the difficulty of providing sufficient officers has necessitated the cutting down of battery establishments to the barest minimum.

The French system of command and fire discipline within the battery must, therefore, admit of being worked without the interpolation of executive commanders between the battery commander or battery leader and the Nos. 1 at the guns. This principle is, however, entirely in accordance with the simplicity, directness, and rapidity that should be characteristic of a true quick-firing battery system, such as can be realized with a small unit of four guns.

ORGANIZATION AND CONTROL OF THE FIRING BATTERY.

Partly from choice, therefore, and partly from necessity, under the new organization, there is only one subaltern officer with the firing battery in addition to the battery commander. This subaltern, who is a lieutenant of the active army, acts as battery leader, lays out lines of fire, repeats the battery commander's orders when the latter cannot be heard directly, and generally supervises the working of the battery. In addition to the battery leader there are two N.C.O. section commanders; but, with the exception of calculating deflection for distribution or concentration of their own sections, they have no executive words of command, and their duties are merely supervisory.

The executive word of command for the guns to be fired is the range given out by the battery commander, and the first gun goes off almost before the words are out of his mouth. The orders as to whether it is to be "battery fire" or "gun fire" and, in that case, the number of rounds per gun, or whether one gun is to be fired at a time, are all given as cautions before the range is ordered. The simplicity of the drill and words of command is very marked, and has much to say to the great rapidity of fire achieved. Thus we see that the natural powers of the equipment are still further developed by a suitably simple and rapid system of fire discipline.

RECONNAISSANCE AND OCCUPATION OF POSITIONS.

Difficulties with regard to clearing crest.

Great importance is attached to every preparation being made beforehand by *groupe* and battery commanders to open fire as rapidly as possible directly the battery arrives in position.

With this object the *groupe* staff or, if the battery is acting singly, the battery commander, goes ahead and reconnoitres the position on much the same lines as in our own system. Battery staffs are reduced to the simplest dimensions by the absence of range-finders, observers, signallers, &c. But, as compared with us, two main difficulties confront the French battery commander in selecting the

position of his battery and observing-station. In the first place, the flatter trajectory of the 75 mm. creates more difficulty in clearing the crest; secondly, the absence of efficient means of communication obliges the battery commander to observe from a position within hail of the battery.

In these circumstances he has to do the best he can to reconcile the following conditions, which are laid down for him in the manual as essential:—

First of all the battery must be able to carry out its tactical task, *i.e.*, it must be able to bring fire to bear on a certain area, the nearer limit of which is usually the important factor, as it delimits the extent of ground which may be left “dead” in front of the guns.

Secondly, the maximum of cover is to be sought.

Thirdly, facility of command must be studied with a view to rapidity of fire.

It will be seen that these conditions must often be conflicting, as, in order to cover the ground indicated, and, at the same time, to clear the crest, the guns must be placed so near the crest as to expose at least the flashes to the enemy's view.

To assist them in solving this problem of clearing the crest, most officers carry a pocket *sitomètre* for measuring the angle of sight. The method adopted to obtain the maximum of cover is to determine the quadrant angle at which the gun must be laid to hit the nearest edge of the area indicated (*i.e.*, find the algebraical sum of the elevation due to range and the angle of sight), and then to walk back from the crest till a position is reached, such that the angle of sight from it to the crest is just less than the quadrant angle to the target.

INTERNAL COMMUNICATIONS OF THE BATTERY.

A weak point in the French system, according to British ideas, is that at present the only practically effective method of communicating the battery commander's orders is by word of mouth, with the interpolation of one or sometimes two orderlies as “transmitters.”

Telephones are in use to some extent, but possibly from want of sufficient experience of the equipment, their use appears to be more or less perfunctory and ineffective.

The same may be said of signalling, which is also attempted in a rudimentary form. Abbreviated conventional signals are used, but no regular Morse or semaphore alphabet, the latter apparently requiring more time to teach than is available with only two years' service.

The result of these limitations is that the choice of position for a French battery is practically limited to within 150 or 200 yards of the crest, and that of the battery commander to within 100 or 150 yards of his battery. But the French are quite prepared to

accept these limitations, and are sceptical as to whether our system of observing from a distance, and placing the battery well back from the crest, would be feasible in war on a large scale.

With the recollection fresh in our minds of the many breakdowns in telephonic and signalling communications that have been witnessed at our practice camps, it is impossible not to treat these opinions with respect, even if we do not altogether agree with them.

METHODS OF FIRE.

Popular misconception of French methods.

For some reason the idea seems to have taken root in the minds of British officers that the French artillery have only one method of fire for use on all occasions, and that, regardless of ammunition or the rules of ranging, or the situation, the one idea of the French gunners is to plaster a whole parish with projectiles. Nothing could be further from the truth.

In point of fact, as will be seen later on, the French methods do not differ very materially from our own, and are based on sound reasoning. The principal difference may be said to lie in the fact that they recognize rather more fully than we do the limitations that will be imposed in war, and endeavour to legislate accordingly.

Laying out lines of fire.

Having chosen his position, the next question for the battery commander is to lay out his lines of fire. In this it is interesting to observe that the French are adopting the system already in use by us, in which the battery leader (i.e., the lieutenant of the firing battery) is entrusted with the duty of getting the lines, leaving the battery commander to concentrate all his attention on the enemy, and the determination of the range and other essentials.

The regulations give two systems of laying out the lines, viz. :—(a) The “simultaneous” method, by means of an aiming point; and (b) the “separate” method. (a) Appears to be seldom employed and, as a rule, not so successfully as (b). In (b) No. 1 gun, which is the directing gun of the battery, is aligned on the target, and the remaining guns ordered “Parallel lines to No. 1.” With the pillar sight of the 75 mm., which is attached to the trunnions of the cradle (see page 304), this method is very accurate and satisfactory. The directing gun is usually aligned by the battery leader standing behind it, or, if necessary, mounted on his horse, use being made of an aiming post, or a man sent out to the front to act as a temporary aiming post. It is laid down that the battery commander may give an angle to this gun with his

telescope, which is fitted as a director. But, in practice, this method does not appear to be used. In fact, the director is hardly used at all, and it appears to be the intention to train officers, as far as possible, to dispense with the use of such apparatus. The reason given for this is that the battery telescope would not be available for use in the preliminary reconnaissance by the battery commander, before the arrival of the battery, as it is carried on the footboard of a wagon.

When no target is immediately apparent, the lines of fire are laid out on a reference point, as in our system. The battery is then said to be *en surveillance*, i.e., in observation. The guns are kept unanchored, ready to be directed on any desired target by moving the trail.

The right gun is always laid on the reference point, and the remainder either parallel to No. 1, or with their lines of fire diverging. Opinions differ as to the merits of the latter alternative, but the latest ideas seem to favour parallelism.

Switches.

Switches are made in very much the same manner as with us. The *faisceau* (i.e., all four lines of fire) being first bodily switched from the reference point, or old target, to the right of the new one by the command "All guns so many *millièmes*² more right or left," the required extent of front being obtained by the order "Concentrate or distribute so much from No. 1." The French do not concentrate or distribute from any gun except No. 1.

There is also a method for making alterations in direction where rapidity is more important than accuracy, corresponding to our "Dial sights and traverse," the French word of command being "So many turns of the traversing wheel right or left," as they have no graduated scale on their breech. One turn of the traversing wheel gives 2 *millièmes* (about $6\frac{1}{2}$ minutes). This method is used for fleeting opportunities, especially with single guns (see page 320).

The battery commander can at any time get his guns back to the original lines of fire by the command "*En surveillance*."

If the lines of fire have been corrected, and the battery commander wishes to keep the corrections in making a switch, he orders "*Inscrivez les dérives*." At that order the layer chalks on the shield the deflection with which he has been firing. When the order "*En surveillance*" is subsequently given, this deflection is put on the sight, and the lines of fire modified accordingly. Switches are usually made direct from one target to another, without having recourse to the "original lines."

² See under "Equipment," page 303.

Gunnery.

The relationship between the trajectory, elevation, angle of sight, and corrector are fully explained in the new manual, but as the theory of these various factors is familiar to us, it is unnecessary to discuss them here.

It may be observed, however, that the French corrector is not calculated on the proportional system, one division of the corrector being equivalent to 1 *millième* at all ranges.

Ranging.

The salient point in which the French system of ranging differs from our own is that they normally range from the start by *salves*, i.e., a round of battery fire at the same elevation from all four guns at 2 seconds' interval, and it is laid down that at least two rounds out of a *salve* must be observed in order to give one end of a bracket with certainty.

If observation is difficult, and the first *salves* show the lines of fire to be wrong, guns are fired singly in succession at the battery commander's order. This is, however, looked upon as more or less a confession of failure, and equivalent to doing a thing "by numbers."

As compared with our own system of one round at each elevation, the French system of *salves* has the following advantages, *but it must be remembered that these advantages apply to a four-gun battery and would be lessened, if not entirely neutralized, when applied to a battery of six guns* :—

- (i) It undoubtedly makes for speed, as it is the rare exception when at least one or two out of the four rounds composing the *salve* cannot be observed, also, because the lines of fire are more quickly obtained.
- (ii) It makes for accuracy, as the elevation is determined on the observation of four rounds instead of on a single round, which may have been badly laid. It is also easier to correct the lines of fire, as the smoke hangs long enough in the air to enable all four bursts to be seen at the same time. Thus a better idea of the relative distribution can be formed than when one burst only is seen at a time. With only four guns it is also possible for a quick observer to correct each gun in turn as it fires, even at 2 seconds' interval. With six guns this would not be possible.
- (iii) Greater moral effect is obtained from the very beginning.

On the other hand, the obvious disadvantage is the risk of wasting ammunition. When the range or line is very much out, ammunition no doubt is wasted, but when these data have been reasonably accurately determined, hardly any rounds are really uselessly expended.

The French range with time shrapnel for the most part, but the

long corrector used gives a considerable number of bursts on graze, which are useful in verifying the range. The superiority of their fuzes and means of fuze-setting render time shrapnel ranging both rapid and trustworthy to a degree that we cannot at present aspire to.

As with us, the greatest stress is laid on the danger of judging elevation by bursts in the air that are not low enough to give trustworthy results. The French rule for this is to disregard rounds that burst more than 1 *millième* (about 3 minutes) above the line of sight, and the trajectory of a round bursting in air short of the target is not reckoned as being short unless the burst is within five minutes of the line of sight. The effective height of burst is taken as 3 *millièmes* (about ten minutes).

A long bracket of 400 metres is usually obtained, and then narrowed to 200 metres. *The degree of exactness to which the range is subsequently verified depends entirely on the time available in view of the nature of the target and the situation at the moment.* Against guns that are visible, or trenches, the range is verified with percussion shell to within 25 metres. At targets that present a certain amount of depth, such as infantry advancing in several lines, searching within the limits of the 200-metre bracket is employed. In the case of an extremely fugitive target, searching may even be started within the 400-metre bracket. No rules are laid down, but the system is eminently elastic, and calls for good judgment on the part of the battery commander.

Effective fire.

Having found the range, fire for effect is carried out by one of three different methods :

- (a) At a single elevation.
- (b) Searching fire by *salves* or *rafales*.³
- (c) "*Tir progressif*."

Any of these methods may be combined with sweeping, which may be either "single" or "double." Sweeping is usually employed when a series of two or more rounds are fired from each gun. In "single" sweeping three turns of the traversing wheel, corresponding to 6 *millièmes* or 20 minutes' deflection, are given between each round ; in "double" sweeping six turns, equal to 40 minutes, are similarly given. The displacement of each successive round is continuous in the same direction, so that, at the end of the series, the number of *millièmes* of front that have been covered is equal either to six or twelve times the number of rounds in the series, according as the sweeping has been single or double.

In the next *rafale*³ the gun is traversed back correspondingly. By this method, and thanks to the simplicity given by the system

³ The *rafale* is practically what we understand by two or three rounds of gun fire, as distinguished from the *salve* which is equivalent to "1 round battery fire, 2 seconds."

of reckoning angular measurements in *millièmes* (see "Equipment," page 303), it is an easy matter rapidly to calculate and execute the orders necessary to cover a certain front. In conjunction with the wonderful rapidity of fire attained, the results are certainly impressive. As the result of a large number of tests with a stop-watch, it may be confidently asserted that, with the carriage anchored, the French artillery can keep up a rate of from 20 to 30 rounds per gun per minute, according as sweeping is employed or not.

A great point is made of this use of the traverse, and great importance is attached to scientific distribution of the lines of fire, so that, on the one hand, the cones of dispersion may not overlap, and, on the other, no gaps may be left uncovered by fire. The width of the cone is taken as 20 metres; therefore, at ranges under 2,000 metres, "double" sweeping is used, and over that range sweeping is "single."

Returning to the three methods of fire mentioned above, (a) is used against targets of little depth, the range to which has been found within a bracket of 50 metres or less, *e.g.*, guns in action visible to the observer. Fire is carried out at the shorter elevation of the bracket if the target is standing up or kneeling in the open, but at the longer elevation if the target is lying down or behind cover, *e.g.*, a trench. This is to take advantage of the steeper angle of descent of the bullets in the after part of the cone of dispersion, which gives greater searching power.

Method (b), searching with rounds of gun-fire, is now the favourite method against the majority of targets. The battery commander orders the number of rounds, and then each range in succession. He thus preserves complete control of the rate of fire and expenditure of ammunition.

The searching is carried out within the limits of whatever bracket there has been time to establish. This method is applicable to targets of any degree of depth, giving the maximum of elasticity and rapidity.

As already stated, the size of the bracket to be established before going to effective fire is entirely a matter of the time available, in view of the situation or the relative degree of accuracy attainable, having regard to difficulties of observation, &c. Great stress is laid on a true appreciation of these factors by battery commanders. We have already accepted this method to a certain extent, as, for instance, in the case of targets on a sky line, the exact range of which is very difficult to determine with certainty. It is for consideration, however, whether the system might not be extended with advantage in view of the fact that, in war, targets are likely to be less well-defined than those to which we are accustomed in peace. In South Africa it rarely happened that anything more definite than a ridge, or group of rocks or line of bushes, was indicated as the place at which to fire, and it is to be expected that, in the future also, areas more or less

clearly defined will be the targets most frequently encountered on service.

It is submitted that, unless trained to expect such targets and deal rapidly with them as effectively as the limitations of the moment allow, we may be rather nonplussed when confronted by them in war, and waste more time in laborious ranging than is likely to be justified by the result obtained.

This in no way suggests that we should relax our efforts at achieving the greatest possible accuracy on all occasions, but it is necessary to realize the fact that absolute accuracy is not always attainable, and to act accordingly.

Method (c), the famous "*tir progressif*," has quite fallen from the place of honour that it formerly occupied, having been entirely displaced by (b), the "*salves or rafales échelonnées*," above described. It is true that it is still retained in the regulations in a slightly modified form, for use in cases where extreme rapidity is essential, but many battery commanders say they never use it even then, and would rather have seen it done away with altogether. It now consists of four successive series of two or three rounds of gun-fire at four successive ranges, increasing 100 metres at each series, i.e., a total of either 32 or 48 rounds which are fired without any further order on the first range being given out. The whole lot is got off in 20 or 30 seconds. The series starts from the lower elevation of a 400-metre bracket, or of a 200 or even a 100-metre bracket in the case of a crest behind which the target is concealed or partly visible.

Occasions on which it might be employed would be against fugitive targets of considerable depth, such as infantry surprised in column, who would scatter and take cover at the first round. Again, it might be used at a battery driving into action, or a commander and his staff reconnoitring. In each case the time available, and the possible value of the result to be expected, have to be weighed against the large expenditure of ammunition entailed.

Section control is frequently resorted to, notably in the case of cavalry targets. As the battery is usually close to the crest, the section commander can generally find an observing station without difficulty.

In certain circumstances the battery commander may order "Sub-section control." Having ranged the battery himself, he tells off certain guns to fire at a given rate per minute.

PART IV.—APPLICATION OF FIRE.

THE NECESSITIES OF WAR.

It is impossible to study the French Regulations, as expounded in the admirable teaching given at their practice camps and schools

of instruction, without being impressed with the fact that one thing, and one only, dominates all their ideas. War—and that on a great scale—is the sole object in view. Moreover, such is the analytical and imaginative power of the French mind, so laborious have been the efforts of their leaders to study the lessons of the past and to apply them imaginatively to the future, that, in many respects, the French army is to-day more alive to the necessities and limitations of modern war than we, who are apt to think that our more recent experience of fighting gives us an unassailable advantage.

Faithful to their quest of the realities of war, the new Regulations, in dealing with the application of fire, begin by pointing out that to shoot well is not merely a question of conforming with the rules of gunnery. It is the correct application of them in a manner appropriate to the situation and the nature of the target that enables a battery to achieve the highest results. The most tangible results, the Regulations go on to say, though by no means the only ones that can be obtained, are produced by actual hits, and to hit must always be the ideal. But the proportion of hits obtainable varies with the degree to which the target is vulnerable, and this factor varies constantly in accordance with the range, formation, and movements of the enemy. Moreover, the relative degree of danger threatened by various objectives also varies. Thus it happens that the application of fire is sometimes influenced by considerations that are quite apart from the technique of gunnery. Even when it is not possible actually to destroy the enemy, his action may be neutralized, or his attention distracted, and the *moral* of one's own troops proportionately raised. These possibilities have all to be weighed in deciding as to what targets should be engaged, when fire should be opened, how heavy it should be, and when it should be stopped or re-opened.

To guide battery commanders in exercising their judgment in this matter, the Regulations give certain principles with regard to the various objectives that may be met with; but, in the new edition, the examples of ranging have been deliberately omitted. The reason given for so doing is that there has been a constantly increasing tendency to legislate for every conceivable situation that might arise, and to add indefinitely to the number of examples, with the consequent danger of letting officers trust to the book instead of to their own judgment.

It is further pointed out that accurate ranging within narrow limits is only possible when observation is fairly easy; it must take time, and, in any case, gives more margin for error than would occur when taking a longer bracket. But it does obtain greater effect with less expenditure of ammunition, provided the target is not one that can disperse or take cover.

In accordance with the urgency of the result to be achieved, the probable duration of the opportunity, and the possibilities of

observation, the battery commander must try for such a degree of effect as he considers necessary. Thus he must decide whether to produce an immediate effect by a large expenditure of ammunition over a comparatively wide space, or to employ a smaller amount of ammunition over a narrower space at the cost of more time.

RANGES.

According to the most recent reports, the French artillery now by no means confine themselves to firing at short ranges. Series are constantly fired at ranges of 4,000 and 5,000 yards, occasionally even at 6,000 yards and over, the average ranges being about 4,000.

It is the firm intention, however, of artillery officers not to expend more ammunition in war at long ranges than they can help, in view of the enormous difficulty of ammunition supply. While recognizing that considerations of moral effect on the other arms may necessitate artillery fire being opened at long range, it is their settled conviction that the issue of the battle is not going to be decided at such ranges, and that the bulk of the ammunition must be reserved for use at ranges that will be decisive.

CAVALRY TARGETS.

With regard to cavalry, it is pointed out that the most that artillery can hope to achieve against such targets is to destroy their cohesion, force them to disperse, inflict a certain amount of actual loss, and deter them from crossing certain tracts of ground.

If the battery is in the open and can see the target, each gun follows it up by direct laying, and rounds of gun-fire are ordered at the shorter or longer elevation of a wide bracket, according as the target is advancing or retiring. If the battery is under cover, the lines of fire are widely opened out, and searching fire opened directly the cavalry enters the zone which they cover.

A problem frequently propounded to battery commanders is the following :—

The battery is supposed to be one of the two batteries of a cavalry division and unlimbered behind a ridge in observation of the ground over which the enemy's cavalry is expected to move. The other battery is supposed to have accompanied the division which is moving to a flank under cover with a view to bringing about the encounter. Such a situation, more than any other, brings out the drawbacks of the French equipment, as, indeed, those of any modern quick-firer. The limit of traverse, which is only about $5\frac{1}{2}$ degrees, is so small that the trail has constantly to be shifted if the direction of the enemy's movement is at all oblique. If the gun is anchored this takes considerable time, while, if it is not anchored, the gun is not steady, and the rate of

fire is much reduced (see page 301). The method advocated in such circumstances is that a bold prediction should be made, and a barrier zone established well ahead of the cavalry through which they cannot penetrate. Any endeavour to follow up the target continuously is strongly deprecated as leading to waste of time, and probably failure of effect.

Section control is resorted to when the enemy's formation covers a wide front.

ARTILLERY TARGETS.

Every effort is made to forestall the enemy's artillery in getting into position, so that advantage may be taken of the moment when it is most vulnerable, and the opportunity seized of overwhelming his batteries as they drive into action. For this, fire is opened with time shrapnel within the limits of a wide bracket on a wide front, and with the greatest possible rapidity. This is, in fact, one of the few occasions to which the *tir progressif* is appropriate, but even then some battery commanders would for choice fire *rafales*, giving out each successive range themselves. It is enjoined that special attention is to be paid to the battery staffs and observers which are always vulnerable, particularly at the moment when the battery is most active.

If the enemy cannot be forestalled in this manner, more methodical procedure is resorted to. If the target is visible, a bracket of 100 metres is obtained, or, if the observation is difficult, a 200-metre bracket, and a rapid searching fire of time shrapnel opened within the limits that are definitely established. Having thus caused initial confusion in the enemy's line, the bracket is verified to within 25 yards, and the detachments behind the shields attacked with high explosive shell. Finally, provided the battery is not wanted for anything else, and if the range permits, the endeavour will be made to destroy the equipment by direct hits. If this is not possible, a section or a single gun is told off to keep down the enemy by delivering bursts of fire directly he shows any signs of activity, while the remainder of the battery becomes available for a further task.

When firing for direct hits, each gun is ranged separately, and the range verified as accurately as possible. Consequently, a limited front only can be attacked in this manner. A front of 100 metres is given as the most that one battery should be given. But if direct hits are not required, it is considered that a battery can very well deal with an artillery target 200 metres in extent, and that power is wasted by concentrating the fire of more than one battery against any front less than that.

When the enemy's guns are not visible, the French procedure is much the same as our own, viz., to range on the crest and search for a certain distance beyond it. Officers are made to study the map, and endeavour to conclude from it, and from what can be seen of the

ground, the most probable position of the hostile battery. For instance, if the tree-tops of a wood could be seen showing over the crest, this wood might be located on the map, and the position of the guns established as being between the crest and the wood. The range to each of these limits would then be found and the ground between them searched. Here, again, the necessity of judgment is insisted upon—in weighing the expenditure of ammunition that would probably be required to produce an effect against the relative urgency of the situation at the moment. If the hostile guns were doing great damage and threatening disaster, it would be imperative to silence them at any cost—otherwise, it might be better to try and locate their observers and cripple the enemy by destroying them.

INFANTRY TARGETS.

It has already been stated that in the French teaching, stress is laid on the fact that infantry cannot be destroyed by artillery fire; similarly, the artillery are trained not to expect to get even any considerable proportion of hits against infantry targets, which are always fugitive, and to a certain extent invulnerable. But, though the actual percentage of loss inflicted may be small, valuable results of a different kind can be obtained.

The artillery of the defence can force the attacking infantry to deploy at a distance and move in extended order from cover to cover. It can make them hesitate to cross the zones exposed to its fire, and take toll of them if they attempt to do so.

Taking into account the individual power of each gun, this rôle, it is considered, can be confided to a comparatively small number of batteries, each one so employed being given, if necessary, as much as 600 or 700 yards of front to watch, leaving the remaining units available for future use as the action develops.

A problem of this nature is a common task for battery commanders at practice. The method of execution often adopted is to divide up the front allotted to the battery between the four guns, each gun being laid on a reference point which the battery commander fixes in his mind, if necessary by means of a rough panoramic sketch. Ranges and angles of sight are ascertained, trial shots being fired if the situation makes this permissible. On the appearance of any small body of the advancing infantry, it is dealt with by the gun most suitably placed for the purpose. The line of fire of this gun is roughly adjusted by ordering the necessary number of turns of the traversing wheel, and series of three, four or more rounds of gun fire with "sweeping" are fired as rapidly as possible, and repeated at different elevations if necessary.

The rapidity of fire of the French equipment is turned to the fullest account by this method, which, in the hands of a really good battery commander, is very fairly effective.

As pointed out, however, by General Percin in an able and interesting report, little good is to be expected by trying to follow small and elusive targets of this nature while in movement. It is more practical to determine beforehand the localities that the infantry would be likely to make for—such as quarries, clumps of trees, bushes, woods, ditches, &c.—and to make ready to open a rapid fire on such points either as fixed targets, when the enemy has been marked down in them, or at the moment when the infantry leaves the cover for a further advance. As the action develops, and the enemy's infantry get closer, the rifle fire of the defence will oblige them to thicken their firing line and so present a tangible target to the guns. Additional batteries will then be brought into action, and fire concentrated on the portions of the enemy's line that are most threatening, or that present the best target, the general procedure being the same as before.

In the attack, artillery can oblige the defending infantry to keep under cover and prevent them using their rifles. (The dense curtain of smoke produced by the French shrapnel will contribute materially to this result.) It can deny them the use of tactical points, and impede the movement of reserves. At such targets as trenches the same procedure is applied as with us—accurate ranging with percussion shell being followed by bursts of fire at the verified range, timed as far as possible to coincide with the rushes of the attacking infantry. This fire may be carried out with time shrapnel or high explosive. When the attacking lines are within 500 metres, fire is in any case continued with percussion shell.

FIRE CONTROL BY "GROUPE" COMMANDER.

The tendency to mistrust mechanical means of communication, already observed within the battery, shows itself still more in the organization and control of the *groupe*. Practically the only method of communication with his battery commanders that the *groupe* commander possesses are his three orderly officers and mounted orderlies.

In cases where the artillery is massed and the batteries of a *groupe* in action together, the *groupe* commander stations himself between two of his batteries and communicates with them verbally. In the case of a *groupe* acting by itself, as, for instance, in an advanced guard, the batteries are usually more dispersed, and the commander posts himself on a flank where he can best watch the situation. In such circumstances the absence of satisfactory means of communication is compensated by more or less complete delegation of responsibility, and battery commanders are given a free hand. This may be effected either by giving each battery a certain section of the front to watch—leaving it to the battery commander to use his own judgment as to when to fire and what to fire at, or each battery may be given a separate task. Thus, in an advanced guard action, one battery would be

detailed to support the advance of a battalion of infantry, the second told off to watch for and engage any hostile guns that might disclose their presence, while the third, the nearest to the *groupe* commander, might be kept in hand for the unforeseen.

TACTICAL SKILL OF FRENCH OFFICERS.

While it may appear from the preceding pages that in regard to the theory and practice of gunnery we may not have much to learn from the French artillery, the experience of all officers who have been privileged to see them at work enforces the conviction that, in the application of fire, their training is undoubtedly superior. In other words, we may be able to hit a given target as well, or in some cases even better than they can, but as regards the knowledge of when to fire and what to fire at, and skill in rapidly appreciating the requirements of the tactical situation, they are on a higher plane altogether.

To the French artillery officer, gunnery, as a thing apart from tactics, is inconceivable—the one has no meaning without the other. Consequently, not even the simplest gunnery problem is propounded or solved without reference to the infantry or cavalry with which the guns are co-operating. As will be seen under the heading of “Training” (see page 332), the presence of infantry and cavalry officers on the ground, and the reference constantly made to them, intensify the feeling of co-operation, but even in the youngest subaltern of artillery the idea seems to be engrained, and matures with experience until it becomes an instinct.

With the British gunner it is to be feared that, as a rule, gunnery and classification have engrossed his professional attention to the exclusion of tactics, which he is apt to look upon as appertaining only to examinations or the Staff College, and beyond the scope of the regimental officer.

PART V.—THE EMPLOYMENT OF ARTILLERY IN WAR.

MODIFICATION OF FORMER IDEAS.

In the principles of artillery employment, the new Artillery Regulations reveal a considerable modification of the ideas that inspired the edition of 1903, since which date a far more thorough knowledge has been gained of the possibilities and the limitations of the 75 mm. gun. Other factors that have induced a reconsideration of their theories have been the adoption of quick-firing guns by the rest of Europe, the experience of the Russo-Japanese War, and also the reorganization of the French artillery entailed by the two years' service law.

It is admitted that former estimates of what shrapnel could effect against troops under cover were somewhat exaggerated. On the other hand, the possibilities of firing from behind the crest have been more fully realized and developed.

EFFORTS TO SECURE PRIORITY OF POSITION.

Consequently, the new Manual abandons the theory that a certain number of guns is in all cases sufficient to deal with a certain front, and the principle now enjoined is to bring into position all available batteries as early as possible in the course of a fight. These positions, which may be either in "observation," or in "readiness," will be under cover, so that batteries will thus to a considerable extent retain their mobility and liberty of manœuvre, but will, at the same time, be ready to open fire at a moment's notice. It does not follow, however, that all batteries will necessarily be required to open fire at first.

ECONOMY OF FORCE.

The question of how many batteries should open fire to start with is no longer merely a matter of the frontage that is being attacked or defended. The answer will depend on a variety of factors, such as the number of guns available and their rapidity of fire, the width of front that a battery can effectively cover (600 to 700 yards), whether destruction of personnel or matériel is the object, and the degree to which the target is vulnerable. It is recognized that, as these factors can never be accurately determined, it is wise to make a very liberal estimate of the number of batteries required so as to ensure a margin of safety. In critical situations it may even be desirable to concentrate absolutely overwhelming force on a portion of the enemy that is particularly menacing.

Generally, the tendency is—so to speak—to empty one bottle before opening another, that is, to exploit the full fire capacity of batteries already in action before engaging fresh ones.

The rate of fire will be most rapid when the target is most vulnerable or most menacing. In other words, *when the result promises to be sufficiently great, or the situation is really critical, the French are prepared to lavish ammunition*, but when there is no great result to be expected, or danger to be warded off at any cost, *e.g.*, against such targets as small parties of infantry dodging from cover to cover, or shielded guns in action in a concealed position, they will be chary of their fire.

Great importance is attached to the necessity of battery commanders correctly appreciating the needs of the moment in this respect and dealing with them rapidly.

THE BATTLE OF ENCOUNTER.

Artillery officers are trained to realize the tactical situation on as broad lines as possible, so that they may turn to account the long range powers of their guns by bringing oblique fire to bear for the assistance of troops on each side of them. With this object in view, the Regulations give a picture of the battle as a whole, and although they deal separately with attack and defence, it is pointed out that a force may well be acting defensively along one portion of the front while it is taking the offensive in another, and that artillery must always be ready to act in either rôle, and pass from one to the other at short notice.

In discussing the employment of artillery in the attack, it is usual to pre-suppose the case of the encounter battle: in the first place, because this is the situation that is most likely to arise in the face of an active and enterprising enemy; and, secondly, because it is this form of action that makes most demands on the qualities of leadership, and requires the greatest rapidity in grasping a situation and determination in dealing with it.

Action of advanced guards.

It is some years now since the late General Langlois pointed out in "*Enseignements de deux guerres récentes*" to what extent our reverses in South Africa might be attributed to a faulty conception of the use of advanced guards with the corresponding tendency to premature attacks, based on insufficient information and ill-considered plans. Yet it must be confessed that a clearer idea of the functions of the advanced guard appears still to be possessed by the French officers than by the majority of our own. These functions they summarize as follows:—

The mission of the advanced guard, irrespective of its size, is threefold:

- (1) To reconnoitre, by attacking all along the line and compelling the enemy to disclose his dispositions.
- (2) To cover the deployment of the main body.
- (3) To hold the enemy to his ground until the main body has deployed for attack.

The first point insisted on is adequate protection for the artillery of the advanced guard. For this reason it is considered inadvisable to allot guns to an advanced guard of less than a regiment (three or four battalions of infantry).

As soon as the presence of the enemy is reported, the advanced guard deploys to the extent required, and pushes forward by "*bonds successifs*" from ridge to ridge, or from one tactical feature to the next. Covered by their infantry, the guns trot up to positions of

readiness or of observation behind each successive crest before the infantry are committed to an advance beyond it, remaining there until the infantry have made good the next ridge or tactical point. Thus each arm in turn protects and supports the other. Should the enemy make its presence felt, the guns open fire in order to facilitate the progress of the advanced guard infantry, and enable the advanced guard commander to carry out his mission of reconnaissance. Due regard is paid to economy of force in deciding as to the number of batteries that shall open fire, in accordance with the principles indicated above. In the event of superior force being encountered, the guns delay the enemy's advance until the main body arrives.

In either case the batteries, being behind cover, retain their mobility and liberty of manœuvre to a considerable extent.

It may here be noted that the fact is constantly impressed on artillery officers that guns cannot hope entirely to stop the advance of well-trained and resolute infantry, but, by forcing them to move in dribblets from cover to cover, they will be able to delay the advance very considerably.

A difficult problem in connection with the advanced guard artillery is the relationship between the positions of the advanced guard batteries and the subsequent deployment of those of the main body.

The initial situation will frequently require the dispersion of the advanced guard batteries. Consequently, when the artillery of the main body is deployed, it will have to be sandwiched into the spaces left vacant, and complication of command must ensue. The following solution of the difficulty has been put forward by some authorities, but opinions are by no means unanimous in accepting this solution, and the question appears to be still an open one. The proposal is that, on the first intimation of contact with the enemy, the divisional commander and his C.R.A. should at once go forward to the advanced guard. The C.R.A. would then and there resume the command of the advanced guard artillery, and dispose it with a view to the subsequent deployment of the rest of the divisional artillery.

When the batteries of the advanced guard are fully engaged, and its infantry have gone as far forward as they can, the advanced guard has shot its bolt and the *prise de contact* is complete. The next phase is ushered in by the appearance of the remaining units of the divisional artillery, which will have trotted ahead of the infantry of the main body to positions of assembly under cover of the advanced guard. Thence they will be distributed to various positions along the front by the divisional commander, *the vital point being to assemble as many batteries as possible in favourable positions before those of the enemy are ready.*

Here at once arises the problem already referred to above, namely, the mixing up of units.

In battles of encounter this will be specially probable, owing to the want of time for complete reconnaissance. This will necessitate a hurried occupation of positions, with the result that important tactical points may be left unoccupied. These will have to be made good later by other commands. An example of this is to be found in the situation at Amanvillers on 18th August, 1870. When the unexpected attack of the IXth German Corps took place, the French batteries of the 4th Corps were hurried out of bivouac into the nearest position, and left unoccupied the important height which commanded the Amanvillers spur and enfiladed the valley behind it. This height had eventually to be occupied by troops from the 6th Army Corps on the right.

Such complications, however, the French regard as inevitable, and endeavour to anticipate. Command will be organized by areas, all units in an area coming under the orders of the senior artillery commander on the spot, irrespective of formation. Advantage will subsequently be taken of the next advance to readjust matters.

Preparatory phase.

With the arrival on the scene of the main body of the division begins the preparatory phase of the battle, i.e., the *combat d'usure*, or long-drawn-out struggle for fire supremacy. In this, the enemy is closely engaged along his whole front, in order that he may be held to his ground and forced to use up his reserves, while the commander chooses the direction, and prepares the means for his decisive blow. Here arises a further problem in the exercise of artillery command, and one which we ourselves have found difficult to solve, namely, the retention of the central artillery control by the divisional commander. The French Regulations are very explicit on the subject, and lay down the principle (*vide* para. 38, page 10, Vol. IV) that when a force of artillery is ordered to support a body of infantry, as, for instance, a *groupe* co-operating in the attack of an infantry brigade, the artillery does *not* come under the orders of the infantry brigadier, but merely subordinates its efforts to assisting the infantry, and remains under the orders of its divisional chief.

In exceptional circumstances only, such as an abnormally-extended front, enclosed or intricate ground, or wide turning movements, will the infantry and artillery be temporarily grouped in a subordinate command. In such cases, definite orders to that effect must be specially given by headquarters.

It is, however, the generally accepted opinion that, whatever the Regulations say, it is very difficult in practice to retain the central control of the artillery. The experience of the 1910 manœuvres is cited to show how far the tendency was carried of allotting artillery to subordinate commands. In several instances even *groupes* were

split up, and batteries allotted to different formations, some unfortunate units having changed hands six or seven times in the course of a day.

The efforts of the artillery during the preparatory phase will be concentrated on helping the infantry to gain ground to the front, which the guns will do by keeping the defenders' heads down, destroying obstacles, and beating off counter attacks. In carrying out this task the guns will of necessity be challenged by those of the enemy, and thus will be brought about a struggle for supremacy between the artillery on either side. As on both sides the guns will probably be firing from behind cover, the struggle between them is likely to be protracted and indecisive. Even if temporarily suspended, it will break out afresh time after time throughout the day.

The French Regulations enjoin economy in the number of batteries employed during this phase, so that the supreme commander may always have something under his hand available for any emergency. Any unit, therefore, that has ceased to be wanted for its original task, or whose fire is not serving some definite purpose, is at once taken in hand again by the central commander. With a view to the difficulty of ammunition supply, fire will be restricted to those moments only when it can be of real value. Thus, for instance, every forward movement of the infantry will be the signal for a burst of fire from the guns.

Decisive attack.

In theory the objective for the decisive attack is disclosed by the fighting during the preparatory stage. It is argued, however, that in practice, owing to the extended fronts now occupied, and the immense numbers employed, the direction of the decisive attack will have to be more or less determined in advance. The choice will depend in a great degree on the possibilities of co-operation between infantry and artillery, i.e., it demands ground over which the guns can see and fire effectively.

Under the direction of the C.R.A., the largest possible number of guns will be concentrated on the portion of the enemy's line chosen for the decisive attack, oblique and enfilade fire being combined with frontal fire.

A portion at least of the guns belonging to the formations kept in reserve will probably be left in reserve with them, if for no other reason than because it will be difficult to find room for their deployment. This may be illustrated by picturing the decisive attack of the XIIth Guard and Xth German Army Corps on Roncourt and St. Privat, as it would have to be made under present conditions. Reckoning 30 batteries to the Army Corps, there would have been room for about 70 on the front in question, thus a portion of the artillery of the Xth Corps, forming the reserve, would have remained with it in reserve, to start with at least.

Special precautions are enjoined to guard the flanks of the decisive attack from the enemy's counter attacks, and also to deal with the fire of guns that the enemy may have hidden and kept masked with the object of enfilading the attacking infantry at the last moment.

It is recognized that change of position may be necessary in order to see better and distinguish with greater certainty between friend and foe. It is interesting to note, however, that prominent artillery officers express a very strong opinion on the subject of guns being sent to accompany infantry to very close quarters. They point out that, so far from the moral effect of such procedure being good, it is likely to have quite the contrary effect on infantry if the latter see their guns smashed to pieces and reduced to impotence alongside them. It is understood that this opinion is shared by the majority of artillery officers, and endeavours are made during practice to demonstrate to the infantry officers present how effectively the co-operating artillery could support an attack, even at ranges of 3,000 yards and over.

ARTILLERY IN THE DEFENCE.

In discussing the employment of artillery in the defence, the Manual is careful to recall the principle that the defensive is permissible only as a temporary expedient, with the fixed intention of resuming the offensive on the earliest opportunity.

The employment of artillery in the defence is limited by the uncertainty that must at first prevail as to the enemy's movements. It will often be desirable to change the position of batteries during the course of the fight, turning to account the liberty of manœuvre bestowed by the faculty of firing from behind cover in order to mislead the enemy.

In the early stages the power of the gun to cover a wide front will be exploited to delay the hostile infantry at long ranges with a small number of batteries. The remainder will be kept under cover ready to deal with the enemy's artillery, without the help of which the attack can make no progress.

The advance of the hostile infantry to within effective rifle range of the defence will produce the fire-fight in which the defending guns must do all they can to enable their own infantry to achieve superiority of fire, and so to destroy the impetus of the attack. This they will do by shelling the attacking lines, which will gradually have been swelled by the arrival of supports from the rear, until they offer targets worthy of a large expenditure of ammunition. One of the most difficult problems is how to bring artillery fire to bear on the dead ground in front of the position when the enemy have reached it. Several alternatives are suggested, viz. :—

- (1) Man-handling guns up to the crest. It is realized that this is not always possible even in good ground, while in bad

ground it is out of the question, and in any case requires time.

- (2) Keeping guns in position behind the crest, and firing point blank when the enemy appears over the top. A special case of this is occasionally tried at practice; the guns continue firing at the lowest elevation that will clear the crest, the fuze being shortened and shortened as the enemy advances.
- (3) When an "offensive return" is contemplated, it will be better to withdraw batteries to a position in rear, whence they can cover the ground that was "dead" from the original position. For example, the retirement of the guns of the 6th Corps from St. Privat to the Jaumont Quarries. Under modern conditions, however, it is permissible to question the feasibility of such a procedure, as it is open to argument whether, in the face of the concentrated fire of a large number of modern guns, even batteries behind the crest would find it possible to withdraw in safety.
- (4) The best plan of all, it is considered, when it can be done, will be to place a battery or two, or even portions of a battery, in positions whence they can flank the approaches and the "dead" ground. These guns will be concealed from the enemy's view as long as possible, and themselves protected in flank by natural or artificial cover. Their action will be most effective at the critical moment of the attack.

CO-OPERATION.

To sum up the principles of employment, whole-hearted co-operation with the infantry in every phase of battle is the watchword of the French artillery. Long association with the idea of war on a great scale, and the close study of its essentials, has engrained this principle so deeply that it has become part and parcel of their very nature. But they are by no means blind to the practical difficulties that lie in the way of complete achievement. This fact was brought out by an infantry officer at a practice camp, who, for the time being, was acting as the officer commanding an infantry regiment which a battery was supporting. Having, as usual, explained to the battery commander the formation and direction of the infantry advance, and indicated the locality on which he would like the guns to direct their fire, he said :

"Yes. That is all very well on this ground which is like a billiard table, with excellent positions for the artillery from which they can watch every detail of our advance, and anticipate every movement of the enemy, but how will it be in ground that is hilly or broken, or intersected with fences and woods,

which obstruct the view? How are we, the infantry, then to communicate our wants to the gunners, and how can they fulfil them in time to be of use?"

In reply to this, it was pointed out how essential it was, on the one hand, for the infantry attack to be organized over ground where the artillery could most effectively help them, and, on the other, for artillery officers to acquire the instinct of divining where and when the infantry would want support. This could only be achieved by constant association and combined training in peace time. It was further impressed on officers how important it was that, whenever circumstances permitted, the *infantry and artillery commanders concerned should confer with each other before a movement was begun, and that each should have an absolutely clear idea of the initial situation and the intentions of the other.*

PART VI.—TRAINING.

COURSES OF INSTRUCTION FOR OFFICERS.

The French authorities devote a great deal of attention and liberal supplies of ammunition for the special instruction of artillery officers, apart from the annual practice of each battery. This instruction is given in the form of courses which are held at the various practice camps early in the year. The courses fall under two categories, viz. :—

- (a) Regional courses for senior subalterns and junior captains, *i.e.*, battery commanders or officers about to be promoted to that rank.
- (b) Special courses for senior officers, including battery commanders, majors, lieutenant-colonels and colonels.

Regional courses.

Six regional courses are held annually in various parts of France. Each course consists of two classes, one for Reserve and Territorial officers, lasting 15 days, the other for officers of the active army, lasting for three weeks. The number of officers in each class is about 35, including Staff College students of other arms attached to the artillery before entering the college.

The course is directed by a lieutenant-colonel selected from one of the regiments of the region. He is assisted by three majors who act as instructors. These may be either on the strength of the *groupes* that provide the batteries for practice, or specially selected from other commands.

Two *groupes*, *i.e.*, six batteries, are required for the service of the course, each *groupe* turning out on alternate days.

In the regional courses, instruction is supposed to be chiefly concentrated on gunnery and methods of fire, tactics being reserved for the senior officer commanding. But so engrained and matured is the tactical instinct in the French artillery, that not even the simplest gunnery problem is viewed from the purely technical standpoint. The idea of co-operation is invariably present, and hardly a round is fired that is not actuated by some definite tactical conception.

The daily programme usually begins with a lecture on gunnery by one of the instructors, supplemented by instruction with the equipment on the parade ground. This is followed by practice, lasting for three or four hours, the special points which formed the subject of the morning's lecture being then practically taught with guns and ammunition.

For practice, the class is divided into three parties, each under an instructor, who has a battery told off to him to use as he likes. Each officer of the party in turn fires a series as battery commander, and also takes his turn as battery leader with the firing battery. It will thus be noticed that the batteries have to work the whole time under officers other than their own. The smooth working of the machine in these circumstances is highly creditable, and betokens a standard of uniformity in training and procedure that will be very valuable in war.

It will be seen that these regional courses are in some respects similar to our short courses of gunnery at Shoeburyness, where, however, no land range and no service batteries are available. There is also a notable difference in the amount of ammunition allowed.

For the two classes a total of 21,000 rounds is allotted, of which some 6,000 to 7,000 may be apportioned to the Reserve and Territorial class, leaving from 14,000 to 15,000 for the class of Active Army Officers. Of these 14,000 rounds, from 4,000 to 5,000 are service shrapnel and high-explosive shell, the remainder being practice ammunition costing about half the price of service shell. All this ammunition is in addition to the annual allowance of 150 rounds per gun which each battery gets for its annual practice.

Method of instruction.

The first week of the course is occupied with elementary practice and devoted to instruction in observation, ranging for fuze and elevation, laying out lines of fire and switches. A few targets, consisting of dummies or screens, are used, but neither in this elementary period, nor in the more advanced practice later on, are any results recorded from the target end. This method allows great latitude to the instructor, who can vary the target to any extent unhampered by range-parties; it also saves time, but, to our idea, it seems likely to make for inaccuracy in ranging. At the same time, great attention is paid to accurate ranging, rounds being repeated over and over again

to make sure of the elevation, and the observance of fundamental rules is rigidly enforced, *e.g.*, accuracy in distribution and line, disregarding high bursts when ranging with time shell, &c. As already mentioned, no series, however elementary, is fired without some reference to the infantry or cavalry that are supposed to be co-operating. After the first occupation of position there is, as a rule, no manœuvring, all the series being fired from the same position. This is, no doubt, in order to save time, and to make as little work as possible for the batteries, which are, so to speak, "on fatigue."

With the second week begin the *tirs de guerre*, each series fired being based on a simple tactical situation, propounded verbally on the spot by the instructor. A certain number of stationary targets are put out on the ground, artillery being usually represented by screens or flashes, and, in some cases, by old pattern equipment, but the targets indicated are more usually features of the ground, such as the edge of a wood, a line of bushes, or a crest line. The instructor has thus the utmost latitude in varying the situation to provide series for the officers of his party during the morning. In no other way probably could as many series be got through in the time.

A feature of the system is that an infantry or cavalry officer is usually present, and, at the request of the instructor, acts either as the officer commanding the troops with which the battery is to co-operate, or as the commander of the enemy. In the former case, the officer would describe in detail, with the wonderful facility and clearness of expression which seems to come naturally to every French officer, the position, formation, direction, and objective of the friendly troops. The battery commander would then be told to direct his fire in the manner best calculated to achieve the end in view, *viz.*, either to enable the infantry to get forward, or to delay the enemy's advance. In doing this he is encouraged to confer with the infantry commander beforehand, and find out from him how the guns could best assist.

If a battery commander is obviously at fault in observation or method, the instructor stops him, and makes him repeat a *salve* or ranging-round again and again, if necessary, until he discovers his mistake. At the end of each series the instructor gives a short critique, pointing out any errors, and suggesting better procedure if necessary.

A great point made in the instruction is the necessity for imagination on the part of the battery commander in thinking out, in the first place, where the enemy's firing line is likely actually to be. This is especially enjoined in the case of a target more or less vaguely indicated, such as a group of farm buildings, or a line of trees or bushes reported to be held by the enemy. After the battery commander has made up his mind on this point, the "Officer commanding the enemy" says where his troops actually are, or in what formation they are moving. Secondly, officers are constantly reminded of the necessity of thinking ahead as to what the enemy would be likely to do next, and to take

steps to meet it. For instance, a body of hostile infantry advancing over a crest alongside a wood, might naturally be expected to take cover in the wood directly they were shelled. The battery commander should accordingly be prepared at once to turn his fire on to the wood after a first *rafale* or two at them in the open. Or again, in supporting an infantry attack, the battery commander is told to try and think out where the counter-attack would most probably be made. Thirdly, great stress is laid on the exercise of judgment in appreciating correctly how far the situation at any moment permits accurate ranging at the cost of a certain amount of time, or to what extent rapidity in obtaining a certain amount of effect is essential, and justifies a comparatively greater expenditure of ammunition.

On some days during the *tirs de guerre* practice is carried out by the *groupe* as a whole. Each of the three instructors in turn acts as *groupe* commander, propounds his own situation, and gives the batteries their respective tasks. Thus, for instance, a typical situation is propounded as follows:—

The *groupe* forms part of the advanced guard of a division moving north. The advanced guard cavalry report the high ground and woods to the front held by the enemy. The *groupe* has come into action behind a ridge to support the advance of the infantry. Of the latter, one battalion is directed against some small copses on the right front, one battalion by a hollow on the left against the enemy's main position; the remaining battalion is kept in reserve under cover.

The advanced guard infantry are checked by guns firing behind the crest of the enemy's main position, and by rifle fire from the copses on the right front.

One battery of the *groupe* is accordingly told off to silence the guns, another battery to support the infantry advance against the copses. The third battery is at first kept in hand, and, subsequently, directed to keep down the flanking fire which the enemy has developed from the edge of another wood on the left.

When each battery has fired a series or two, the battery commanders and battery leaders are changed, and a new situation is given out. This time the *groupe* is supposed to be one of the units of the main body, brought up to reinforce the advanced guard, which could get no further. The advance of the infantry of the main body is described as before, and further series are fired from each battery at more or less the same targets. The progress of the infantry is indicated from time to time to battery commanders, and when the attack gets to within 500 yards of the copses, the battery concerned starts firing with percussion shell at the edge of the wood, and searching for 200 or 300 yards inside it—delivering good bursts of fire corresponding with each rush of the infantry. When the copses are captured, the battery commander at once directs his fire on to the open space

behind it, over which he had calculated that the enemy would have to retreat.

Senior Officers' course.

The senior officers' course, which includes about 60 officers, lasts about three weeks. No less than 50,000 rounds and five *groupes*, i.e., 15 batteries, are devoted to their instruction. A colonel is appointed commandant, and is assisted by the five *groupe* commanders as instructors.

The general procedure on this course is the same as at the regional courses for junior officers, but instruction is mainly devoted to the tactical application of artillery fire. The operations of two or more *groupes* in combination, reconnaissance of positions, and the supply of ammunition from the *échelons* in rear are also practised.

Here also there are no range parties, and the instructors have the utmost latitude in framing schemes and modifying the situation at will.

COMPARATIVE MERITS OF THE SYSTEM.

In all essentials, such as the absence of range parties or classification, and in the excellence of the tactical instruction, the system under which the service practice of batteries is conducted resembles the procedure at the courses.

The advantages and disadvantages of the system from our point of view may be summarized as follows:—

The absence of range parties and any pre-arranged system of targets gives a free hand to the instructor. It enables him to vary the targets to an unlimited extent, even in a narrow arc of fire, from a fixed position. It enables any series to be repeated several times, if necessary, in order to correct mistakes, or to show what the procedure should have been. It saves a great deal of time, enabling three or four times as many series to be fired as could otherwise be got through. But its special advantage is the increased opportunity for tactical instruction in the application of fire to any situation.

Against these advantages must be reckoned some loss in the value of the instruction in ranging and observation of fire. Every gunner knows, to his cost, how deceptive an apparently good series may be when judged only from the battery end of the range. If results are never recorded, it is difficult to believe that adequate instruction can be given in the elementary essentials of good shooting, and few British gunners would probably be willing to dispense with range reports altogether.

On the other hand, it is not sufficient merely to be able to hit a target when it is pointed out as such. In war, before a target can be hit it has to be located, if possible, anticipated. In war, not the least

of the difficulties with which battery commanders find themselves confronted is that of deciding what the target should be, where it actually is, whether they ought to open fire or not, and how much time or ammunition should be devoted to it. All these questions have to be answered before the technical problem of finding range and fuze can be tackled satisfactorily. It is from their system of instruction in this part of the artilleryman's trade that we have most to learn from the French; in other words, in the application of gunnery to tactical requirements. In the technique of gunnery pure and simple, and in our system of acquiring it, it is fair to say that we can hold our own.

Last, but not least, the element of competition or classification has no place in a French practice camp. The one idea that dominates the French artillery at practice, as at all other times, is preparation for war. Consequently, their efforts are unceasingly devoted, not to surpassing other batteries, nor to the acquisition of badges, but whole-heartedly towards fitting themselves to beat the enemy.

EFFICIENCY OF PERSONNEL.

All officers who have had the privilege of seeing them at work are loud in their praises of the French artillery personnel. Officered by a body of gentlemen second to none in the physical, mental, and moral attributes that their service demands, the N.C.O's. and men reach a pitch of perfection that, in view of the short time available for training, is quite wonderful. Although the length of service of the detachments at practice averages well under a year, as the men in their second year are mostly required for employments or fatigues, the steadiness, rapidity, and precision of their drill leave nothing to be desired. Such a standard, indeed, could not be reached except by a nation that is prepared to give its best for the country's service.

With the possibility of a struggle for national existence an ever-present reality—a reality undreamed of by many in this country, where war is too apt to be looked upon merely as combining a means of personal advancement with the highest form of sport—can we wonder the French have decided that, to guard against such a menace, nothing but the best will do. By virtue of the principle of universal obligation, the nation is enabled to send into the ranks of her artillery the pick of her mechanics and skilled artificers. From this excellent material the energy and devotion of the regimental officers, ably guided by an admirable staff, have forged that incomparable machine, the French Artillery.

III.

THE ARMED FORCES OF AUSTRIA-HUNGARY.

THERE is perhaps no State in Europe of whose composition, constitution, and future development it is more difficult to form clear and correct conceptions than Austria-Hungary. Its ethnical arrangement, history, political system, and national aspirations form a study of the utmost complexity. Abbreviation in such a case is almost inseparable from generalization and error, yet a few words on ethnical and political conditions must necessarily precede an account of the resultant military system.

Austria-Hungary is not, strictly speaking, an Empire, a nation, or a country in the same sense as other European States. It is perhaps better described as a Government, at present of a dual nature, directed by the Hapsburg dynasty, into the sphere of which various kingdoms, principalities, and races have, from time to time, been attracted by stress of circumstances, or by considerations of mutual advantage. There is, however, no doubt that patriotic pride in the Empire as a whole, and consciousness of imperial unity, are feelings which are growing rapidly throughout the Empire, and are seen to be by no means irreconcilable with the retention by each nationality of its highest racial ideas. The influence of the welding factors, a common dynasty, a common army, and a strong sane foreign policy, such as that pursued by the late Count Aerenthal, has increased greatly of late years and is still increasing.

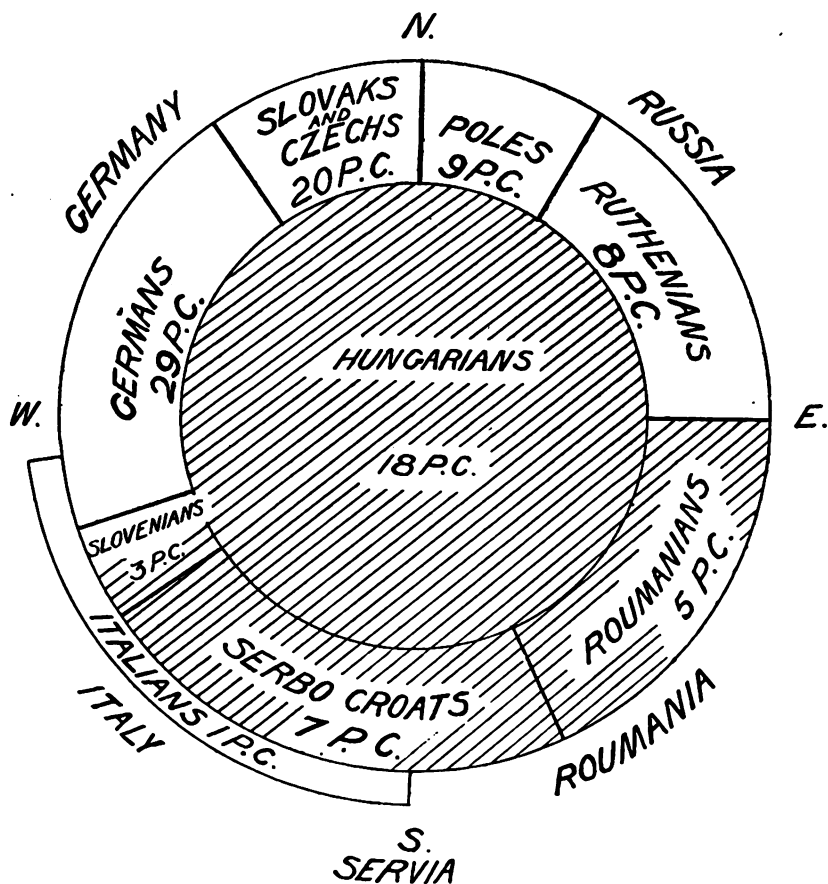
ETHNICAL COMPOSITION.

The present geographical grouping of the various nationalities is shown roughly in the diagram on p. 337,

It must not be supposed that the diagram represents the actual admixture of the different races, for all are mixed together in isolated groups, often so minute that nothing but a map on an enormous scale can give any idea of the labyrinthine tangle.

It is hardly possible within the limits of this paper to enter into the historical causes which have brought about this strange amalgamation. Very roughly and generally, it may be stated to have arisen from the impossibility of resisting by any means, other than

mutual support under a single political chieftainship, the invasions of the Turk, and the menacing preponderance of Russia. Fear of the former is no longer operative, though its memory lingers; fear of the latter has considerably diminished of late years. Resistance to Napoleonic domination has also had a considerable share in the consolidation of the monarchy.



Races incorporated in Hungary	..	..	Shaded.
„ „ Austria	..	..	Unshaded.

All the nationalities shown in the diagram are linguistically and racially distinct. Almost all of them have a strong national consciousness and particularist tendencies. Most of them have divergent and conflicting interests and aspirations. Many have memories of mutually inflicted injuries in the not distant past. It is, therefore, not surprising that strong centrifugal tendencies and discontent with existing conditions prevail in the Austro-Hungarian agglomeration. Dissatisfaction is at present perhaps most acute among the

nationalities which are subject to the sway of Hungary. But also in Austria proper, the strife of nationalities rages, and Parliamentary Government is carried on at times with great bitterness.

There is no single one of the various nationalities which, after a sane examination of its own case, can wish for separation. In each instance the evils of such a course are seen, on examination, to be greater than those endured under the present system. None can hope to stand alone.

From a commercial point of view the various lands are supplementary to the needs of each other, and have long been accustomed to each other's ways. Vienna is geographically their great national market, and union means strength and economic advantage. The close admixture and superposition of the various races are also a guarantee of unity.

CONSTITUTION.

Up to the middle of the last century, the underlying idea of Government was centralization, germanization, linguistic unity, and suppression of all particularist feeling among the nationalities.

Against these ideas Hungary rose in armed rebellion in 1848. Though materially vanquished, she remained morally victorious, and in 1867, the Ausgleich or Compromise was accepted by the Emperor, and forms the basis of the present political system.

According to the Constitution now in force, Austria-Hungary consists of two separate independent States. Firstly, the kingdoms and lands represented in the Council of the Empire (Reichsrat), unofficially called Austria. Secondly, the kingdoms and lands of St. Stephen's crown, unofficially known as Hungary. Each State is independent of the other, and has a Parliament, a Government, and an Army of its own. Unity is expressed in the common head, who bears the title of Emperor of Austria, and apostolic King of Hungary. Co-ordination for common objects is assured by the existence of a common administration for joint affairs, consisting of the Ministries of—

- (a) Foreign Affairs ;
- (b) The Joint or Common Army and Navy ;
- (c) Finance.

The chiefs of these three Ministries are appointed by the King-Emperor.

The right of voting and controlling expenditure for common affairs is exercised by the Delegations. These consist of two bodies, each of 60 members, chosen annually from the Austrian and Hungarian Parliaments respectively. The Delegations are convoked annually, and assemble in alternate years at Vienna and Budapest respectively. Though they meet annually at one of the two capitals, they do not form a permanent assembly, nor sit together as one body except in

case of dispute. The control exercised by them over the three common Ministries is not of a very stringent nature; they have little voice in nominating or dismissing the three Ministers for Joint Affairs.

GENERAL ORGANIZATION OF THE ARMED FORCES.

The armed forces consist of :—

- | | | |
|--|---|--|
| (1) The Common Navy ;
The Common Army | { | Administered by the Common Minister for War and financially controlled by the Delegations. |
| (2) The Hungarian Honved Army | | Administered by the Hungarian Defence Minister, and subject to the Hungarian Parliament. |
| (3) The Austrian Landwehr Army | | Similarly administered by the Austrian Defence Minister and Parliament. |
| (4) The Landsturm | | Territorially administered by the Hungarian and Austrian Defence Ministers. |

The estimated peace strengths of the above forces are (omitting the Navy) as follows :—

	Infantry.	Cavalry.	Artillery.		Other Arms and Departments.	Other trained men available.	Total.
			Men.	Guns.			
Common Army ...	187,927	45,628	33,583	1,232	38,776	...	305,914
Austrian Landwehr	39,777	4,325	2,126	64	1,856	...	48,084
Hungarian Honved	24,673	4,967	...	...	3,130	...	32,770
Total ...	252,377	54,920	35,709	1,296	43,762	...	386,768

Care must be taken not to attach the German sense to the word Landwehr. The Austrian Landwehr, like the Hungarian Honved, is an active standing army, and in no sense a reserve formation.

The supreme command of all the above-mentioned forces is vested in the monarch, whose offices as Emperor of Austria and King of Hungary are rigidly kept apart, and yet whose consent as King-Emperor and Chief of the Common Army and Navy is necessary to the validity of any act of Empire as a whole. The total armed forces of the monarchy form a whole under his sovereign direction.

The joint Minister for War works through the War Office (the organ of the Common Army) and the Chief of the General Staff. He is invariably a soldier, and has the control of all naval and military affairs, except those of the Austrian Landwehr, and of the Hungarian

Honved Army, which are committed to, and controlled by, the Defence Ministries of the two respective States. He is entirely responsible to the Emperor for the Navy and for the Common Army.

The Chief of the General Staff, though subordinate to the joint Minister for War with regard to the Common Army, is yet the direct adviser of the Emperor in matters affecting the co-ordination for war of the three armies as a whole.

THE ARMED FORCES.

(1) *The Joint or Common Army.*

Leaving aside the Navy, the Common or Joint Army will first be considered. It is recruited from the monarchy as a whole, but the two annual recruit contingents are voted by the Austrian and Hungarian Parliaments respectively. The contingent in 1911 was 103,100, viz., 59,024 from Austria, and 44,076 from Hungary. The term of service with the colours is at present three years, but this is to be reduced in the future to two. Seven years are spent in the Reserve, and two years in the Second Reserve.

The new units formed on mobilization are comparatively few; in war, about one-fifth of the battalions, one-seventh of the squadrons, and one-fifth to one-third of the batteries would be units freshly formed on small existing cadres.

Since, therefore, some four-fifths of the war units exist in peace, and since the peace strength in men is only about one-third of the war strength, it is evident that the units which exist in peace have to be kept short of men to an extent that is prejudicial to their effective training.

Thus an infantry company, which in war has a strength of 250 rank and file, has a peace establishment of under 100. On the other hand, the only alternative, under a short service compulsory system, is to organize on mobilization a number of entirely new formations, a course beset with perhaps greater disadvantages.

Infantry.—The infantry of the Common Army consists of 467 battalions, viz., 110 four-battalion regiments, and 27 independent rifle battalions. Every battalion consists of four companies, and has, or will shortly have, a machine gun section of two Schwarzlose guns, carried on pack mules.¹ The rifle used is a small bore Mannlicher (.315"), 120 rounds are carried on the man, 40 on the company wagon, and 160 in the divisional S.A.A. column. Each regiment forms on mobilization a fifth battalion, known as an Ersatz battalion, for which a small cadre exists in peace. Similarly, each independent rifle battalion forms an Ersatz company.

¹ Three hundred and fifty-eight out of the 467 battalions are at present provided with machine gun sections.

Every company is provided with a telephone and about a mile of wire.

The first line transport of a company consists of a company wagon and a travelling field kitchen.

Infantry Brigades, of which there are two in a division, are of varying size, and consist of from six to nine battalions. The Brigade is not regarded as a tactical unit ; in action, the regiments and battalions of a division would be grouped according to circumstances.

Cavalry.—The cavalry of the Common Army consists of 42 regiments (252 squadrons). Though divided into dragoons, hussars, and uhlands, all are armed alike with a sword and short Mannlicher rifle, the latter carried slung on the back. A regiment consists of two divisions, each of three field squadrons, a pioneer troop, and a telegraph section, and is thus more than the equivalent of two regiments in the British Service. The telegraph section has four telephone stations, with $12\frac{1}{2}$ miles of wire. A squadron at peace-strength has 150 horses, its war complement being about 170.

There are now 16 cavalry machine gun sections, each section consisting of 4 guns carried on pack horses, and 2 ammunition wagons. These are distributed among the higher cavalry units, whose composition is given later.

Each regiment on mobilization forms a reserve squadron, for which a cadre exists in peace-time.

The horse supply of Austria-Hungary is the largest and best in Europe. Well-mounted and well-trained the Austrian cavalry has always enjoyed and deserved the highest reputation.

Artillery.—There are 24 horse artillery, 168 field artillery, 56 field howitzer, 26 heavy howitzer, 35 mountain, and 10 mountain howitzer batteries, in the peace establishment of the Common Army.

The horse artillery is organized in 8 divisions of 3 batteries each ; the field artillery into 42 regiments ; and the field howitzers into 14 regiments of 4 six-gun batteries each, grouped in 2 divisions of 2 batteries. The heavy howitzers are in 14 divisions of 2 four-gun batteries.

The mountain artillery, consisting of 46 four-gun batteries, is organized in 7 regiments. The horse and field artillery gun is a shielded Q.F. gun of about 3" calibre, firing shrapnel and high explosive shell. It has not an independent line of sight, nor is any fuze-setting machine or corrector employed. It is so constructed that the wheel track can be diminished by substituting a short axletree and low wheels for those in ordinary use, and is thus adapted for use on narrow or mountain roads. The rounds carried per gun, 498 in all, are distributed as follows : 33 in the limber, 93 in the battery wagons, and 372 in the divisional ammunition columns. On mobilization, each Field Regiment forms two fresh batteries and a reserve or depôt

battery. The light field howitzer is a 4·1" 30-pounder; the heavy howitzer has a calibre of 5·9" and fires a shell of some 80 lbs. weight.

Auxiliary Services.—The engineer troops are permanently divided into Engineer Staff Officers, Pioneer troops, Railway troops, and Telegraph troops. Supply and Transport are separate duties undertaken by two distinct services, viz., the Supply Corps (Verpflegsbranche) and the Transport Corps. A noticeable point in the Medical Service is the existence of "Officers of Medical troops" who are not doctors, but deal with discipline and administrative questions, and thus relieve the Army Medical Doctors of a large amount of necessary but non-medical duties.

Liberal provision is made for the study and practice of military aviation.

An Army Air Corps was raised last year, and it is reported that a flying park of four machines will in the near future form part of each Army Corps.

(2) *The Austrian Landwehr.*

This force is recruited from the Austrian portion of the Monarchy alone, and is raised, paid, controlled, and administered by the Austrian Ministry of Defence. The period of service is two years with the colours and ten years in the reserve.

Infantry.—There are in all 37 Austrian Landwehr Infantry Regiments and 3 Rifle Regiments. Generally speaking, each Regiment has 3 battalions. The battalions are armed and equipped and organized in a similar manner to those of the Common Army. Each battalion has a machine gun section.

Cavalry.—The mounted troops of the Austrian Landwehr consist of 6 Uhlan Regiments of six squadrons each; 3 squadrons of Tyrol Mounted Rifles; and 2 squadrons of Dalmatian Mounted Rifles.

The six cavalry regiments are similarly armed and organized to those of the Common Army, but the Regimental Pioneer troops exist in peace in the form of cadres only.

Artillery.—There are eight Landwehr divisions (16 batteries) of light field howitzers, organized, armed, and equipped like those of the Common Army.

Auxiliary Services.—These do not exist. The Austrian Landwehr is organized into eight Infantry divisions, the whole of the auxiliary services for which are, with the exception of the light field howitzer batteries, provided by the Common Army.

(3) *The Hungarian Honved Army.*

This force is recruited in Hungary alone, and is administered by the Hungarian Ministry of Defence. The terms of service are similar

to those of the Austrian Landwehr. There are 28 Regiments of Honved Infantry, of which 10 have four battalions, and 18 three battalions each, in addition to an Ersatz (reserve) cadre. The armament, organization, &c., are similar to that of the Common Army and Austrian Landwehr, and each battalion has a machine gun section. The Cavalry consists of 10 six-squadron regiments of hussars, armed and organized like the Austrian Landwehr Cavalry Regiments.

The Honved Army has no auxiliary services or artillery; the seven infantry divisions into which it is organized are provided with these by the Common Army.

HIGHER ORGANIZATION OF THE THREE FORCES.

(See Map at end of article.)

Apart from Garrison troops, the Common Army is organized into 33 Infantry Divisions, 8 Cavalry Divisions, and 2 Independent Cavalry Brigades. It provides, in addition, the artillery and auxiliary services for the 8 Infantry Divisions of the Austrian Landwehr Army and for the 7 Infantry Divisions of the Hungarian Honved Army. The whole monarchy is divided for military purposes into 16 Army Corps or territorial districts (8 Austrian, 5 Hungarian, and 2 Bosnian and Dalmatian). The normal composition of an Army Corps is two Common Army Divisions and one Landwehr or Honved Division. The 2nd (Vienna) Army Corps has, however, four divisions, while the 15th and 16th Army Corps in Bosnia-Herzegovina and Dalmatia are organized specially for mountain warfare, and consist of two divisions each. Each of the first 14 Army Corps is mostly recruited from its own territorial district, while the 15th and 16th Corps consist, to a large extent, of battalions and other units of the Common Army, detached from their own regiments and territorial districts. The units of the 15th and 16th Corps are kept up to a somewhat higher peace-strength than those of other Corps.

Ordre de bataille of the Austro-Hungarian Army (showing roughly the composition of higher units).

Cavalry Regiment (42 } Common Army, 18 Landwehr & Honved.)	6 squadrons	{ All ranks 1,136, sabres 1,000 2 Divisions (each of 3 squadrons)
Cavalry Brigade (19 } Common Army).	12 squadrons	All ranks 2,290 2 Regiments (each 5 squadrons)
Cavalry Division (8 } Common Army).	24 squadrons 12 guns ...	{ All ranks 6,500, sabres 4,200 2 Brigades Cavalry 12 guns Horse Artillery 4 Machine Guns

Ordre de bataille of the Austro-Hungarian Army—continued.

Divisional Artillery (320 Field and Mountain Batteries).	36 guns	...	Field Artillery Regiment ... 1st Division = 2 batteries, 12 guns 2nd Division = 2 batteries, 12 guns Field Howitzer Regiment (2 batteries) 12 guns All ranks 3,000 to 4,000 8 to 12 Machine Guns
Infantry Regiment (681 Battalions).	...	...	3 (Landwehr and Honved) or 4 (Common Army) Battalions, each battalion 1,000 strong All ranks, average 7,500 2 Regiments (each 3 to 4 battalions, and sometimes 1 battalion of rifles)
Infantry Brigade.	...	...	All ranks 20,550 2 Brigades Infantry 36 Guns and Howitzers 3 Squadrons Cavalry
Infantry Division (33 Common Army, 8 Landwehr, 7 Honved)	15 battalions 3 squadrons 36 guns	...	All ranks 53,000 3 Infantry Divisions³ Corps Artillery 8 Heavy Field Howitzers
Army Corps ² (16 in all).	45 battalions 9 squadrons 115 guns	...	

² The 2nd Army Corps has 4 Divisions, the 15th and 16th Army Corps have 2 Divisions only.

³ One of these Divisions being a Landwehr or Honved Division.

RECAPITULATION.

The total forces available for war may be summarized generally as follows :—

1st Line, about 1,000,000 men, organized into 16 Army Corps (48 Infantry Divisions), 8 Cavalry Divisions, and 2 Independent Cavalry Brigades.

2nd Line, about 260,000 men, of the older classes of the Reserves, for whose incorporation unit cadres (battalion, battery, squadron, &c.), exist in peace. No arrangements are known to exist for their organization into higher units.

3rd Line, about 1,000,000 men of the Landsturm, for whom no organization or cadre units exist in peace.

The Army is well-equipped and thoroughly trained in a modern and uniform manner. The *moral* is good. Among neither officers nor men of the triune forces, proud as they are to regard themselves as the highest corporate expression of imperial unity, and of the common devotion of Austria-Hungary's many peoples to their joint sovereign, does the strife of nationalities find an echo. The officer corps is well-educated, intelligent, and zealous. The rank and file, chiefly drawn from a healthy agricultural population, is loyal, obedient, and enduring. Socialistic and anti-military tendencies have as yet made but little headway. The General Staff is highly trained and



MAP OF
AUSTRIA HUNGARY
 Shewing
**ARMY CORPS DISTRICTS, AND
 DISTRIBUTION OF TROOPS.**
 Explanation

Head Qrs. Infantry Division Common Army (Nº I) 1
 " " " " Landwehr or Honved (Nº 42) 42
 " " Cavalry Brigade (Nº II) II

Geographical Section, General Staff. Nº 2615.

SCALE 1:3,000,000
 Miles 50 40 30 20 10 0 50 100 Miles
 1 inch = 47.35 miles

War Office February 1912.

efficient. The horse supply of Austria-Hungary is the best in Europe, and the Austrian cavalry has always held and deserved a high reputation.

In aeronautics great progress has been, and is being made, and in military aviation, Austria, though behind France, may be considered to be almost abreast of Germany.

The liberal provision of machine guns and the excellence of the musketry training are a source of strength to the Austrian infantry.

The proportion of artillery to other arms is somewhat small as compared with other armies; the absence of an independent line of sight for the field guns is also a disadvantage.

The war employment of the forces above described, dependent on foreign policy, is outside the scope of the present paper. In peace, the army constitutes the highest national expression of the Imperial unity of the many peoples of Austria-Hungary, of their common heritage of past traditions, and of the ideals and destinies, common to all, which yet await fulfilment in the future.

IV.

THE EMPLOYMENT OF CAVALRY.¹

By COLONEL SIR PHILIP CHETWODE, Bart., D.S.O.

PART I.

EACH time that Part I, Field Service Regulations is consulted, one wonders more how its compilers managed to compress such a vast amount of information in so small a space. Naturally, the book deals chiefly with broad principles, and the average officer, confronted for the first time with the numerous problems in connection with the command of a force of all arms, probably feels that he would like answers in greater detail to many questions about those branches of the service to which he does not belong himself.

This seems to be particularly the case when officers of other arms have to dispose of their cavalry. No one can have had much experience of combined operations, whether they have taken a form of recent wars, peace manoeuvres, or staff tours and war-games, without realizing that more often than not the best value is not got out of the cavalry, and that officers of other arms seem to find considerable difficulty in deciding how they should employ their cavalry to the best advantage; and when they have decided, how to translate their wishes into the form of orders.

This uncertainty as to how to get the best value out of cavalry may be due, in the case of the detached duties of the arm (reconnaissance, protection, &c.), to the fact that the methods employed to-day by European cavalry are to a very large extent of recent growth, a modern art, evolved from the truer appreciation of the mistakes committed in 1870 and later wars; which methods have never been put to the test of war by equally matched forces, and have consequently no history. In the matter of how to employ them on the battlefield in close co-operation with the other arms it may be due to the mistrust of the arm engendered by the mischievous doctrine that is still prevalent, and has taken such deep root, that the possibility of the intervention of cavalry on the battlefield is such a remote contingency as to be scarcely worth considering.

¹ A Lecture delivered at Aldershot to the 2nd Division.

In spite, however, of the fact that the two most recent campaigns do not furnish the cavalry enthusiast with as much direct proof of his contentions as he could wish, and even supply the detractors of the arm with much material for head shaking and a "told you so" attitude, the opinion of those responsible for the preparation for war of all European armies has undergone no change as to the value of cavalry. Some are even increasing the proportion of the arm, and it is well to remember that the cavalry "opinion" of Europe as to the method of its employment, including our own, is crystallized to an extent that is perhaps scarcely realized.

Cavalry officers in Europe have the highest hopes of the results of the next campaign, and even if they are destined to fail, it is well that officers of other arms should know what they mean to attempt, and not lay the whole question aside and take refuge behind the shibboleth "the other arms have now-a-days nothing to fear from the cavalry."

That has to be proved; it has not been proved to the satisfaction of those who will have the direction of the cavalry masses in Europe in the next war.

Those masses may be used against us—" *Verb. sap.* "

The prospective commander of all arms probably asks himself the following questions with regard to his cavalry:—

1. How had I better employ my cavalry, and what have I a right to expect of them—(a) In the strategic phase? (b) In the matter of protection? (c) In the matter of co-operation on the battlefield?

And in connection with each:

2. How can I best distribute them to get full value out of them in each case?
3. How should I put my demands before them in the form of orders?

Very largely, of course, all the above questions can be answered by reference to Field Service Regulations, and this paper is only an attempt to enlarge on what is laid down in that book, the size of which prevents more than general principles being dealt with.

Let us take the questions in the order given above.

(a) What have I a right to expect of my cavalry in the strategic phase? . . . Answer from Field Service Regulations—"strategical reconnaissance, that is before the opposing armies are within striking distance, for the purpose of locating the hostile columns, their strength and direction of march, and thus afford the commander information on which to base his strategical plan of operations."

Field Service Regulations also states that the "independent" cavalry should be employed for this purpose, and that their commander should be given complete freedom of action in carrying out his task. (Field Service Regulations, Chapter VI, Sections 90-91.)

Field Service Regulations, referring, of course, to large forces, states that "other missions such as seizing and holding certain lines, areas of country, &c., the possession of which is necessary to the plan of operations, is to be the task of the protective cavalry," but in smaller forces a commander will have to use part at any rate of his reconnoitring cavalry for such purposes if the situation demands it.

In explanation of the term "independent cavalry," a footnote in Field Service Regulations, Chapter V, Section 65 (1), states: "The independent cavalry is 'independent' only in the sense that it is at the immediate disposal of the Commander-in-Chief, and is not charged with the direct protection of any slower-moving body of troops. It co-operates with the other troops in giving effect to the will of the Commander-in-Chief, as much as any other formation."

Perhaps because this is a footnote it has escaped general observation; at any rate, the sense of it does not seem to have been generally grasped. Some seem to think that the independent cavalry go off "into the blue," and there carry on a sort of private little campaign of their own with the hostile cavalry, quite unconnected with the general plan, while others clearly show they do not grasp the necessity for their independence by issuing such orders as "the force, *covered* by the independent cavalry, will advance," &c. This is an extremely common form of order, even by quite senior officers.

The subjoined rough diagram may help to explain why cavalry, entrusted with the vitally important duty of strategical reconnaissance, must necessarily be independent of other formations, and, incidentally, why they cannot "cover" or "screen" and reconnoitre at one and the same time.

Field Service Regulations confines itself to stating that they cannot do so.

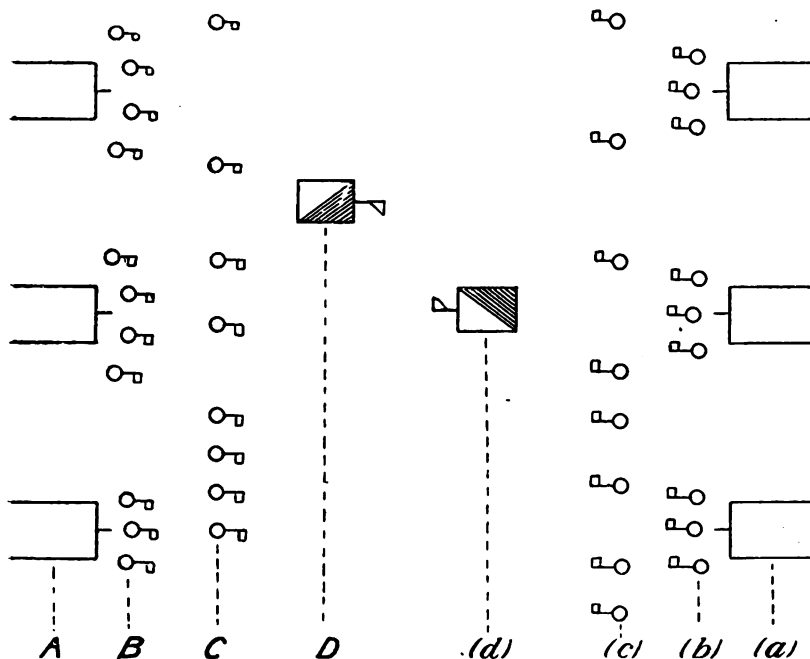
The wavy line is the frontier between two hostile forces. A and (a) are the opposing heavy columns, either mobilizing or detraining at their appointed places in the railhead deployment; B and (b) are the divisional cavalry; C and (c) the protective mounted troops and D and (d) the cavalry masses, the so-called independent or strategical cavalry.

Why must we then give D or (d), namely, our cavalry charged with the task of reporting on the hostile A or (a) columns, complete freedom of movement, and not saddle them with the screening or protection of our own A or (a) columns? The answer is simple, because the movements of the D or (d) cavalry depend on an unknown factor, that is to say, the movements of A or (a), whereas the movements of a screening or protecting force obviously depend, both as to direction and length of march, on the body they are covering.

If both hostile forces advanced absolutely perpendicularly towards each other, it might at first sight seem that the two duties might

be combined ; but even then, as a matter of fact, they cannot be, with any prospect of success.

Supposing, however, the A columns advanced straight to their front, but the plan of campaign of their enemy causes the (a) columns to advance diagonally, it is obvious that unless A get early warning of such a move, part at any rate of their force will strike in the air.



It should be remembered that the flank is always the most favourable position for cavalry to be in in order to obtain information, Cavalry, however strong, are not likely to be able to do more than report on the heads of large columns, and will not, even with small detachments, be able to penetrate between them. From a flank they can under favourable circumstances report not only on the head, but the length of a column.

One often hears it said : " Why cannot we employ small detachments to find all this out, squadrons, patrols, and so on, and keep the mass of horsemen to ensure our own movements being kept absolutely secret ? Why is it necessary in order to get information to send them out in masses, covering but a small front ? "

Does Field Service Regulations help us here ? Not very much, but Cavalry Training, 1907, is more explicit. Section 144 says : " In this area (i.e., the zone separating the two armies) the hostile cavalry will usually be operating, and until it has been disposed of, the

independent cavalry will find it impossible to obtain full information of the enemy's columns. For individual scouts, patrols, &c., have but little penetrative power, and will be checked or brushed aside if opposed by larger bodies, while those who do get through will find it difficult to transmit the information they have gained. . . . Reconnaissance must, therefore, be expected to culminate in a tactical collision."

What does all this mean? It means commanders must realize that to get the best information their cavalry will have to fight, and fight hard.

That fighting demands concentration.

That screening and protection imply dispersion, and, therefore, inability to take the offensive, and impose a defensive attitude.

That small reconnoitring detachments may and will find out something if they are lucky, but that most of them, unless closely supported by the vigorous action of formed bodies, will merely dash themselves against the hostile protective troops like waves against a cliff, with the same result.

That, if we employ the bulk of our cavalry in screening duties and the enemy does not, our detachments will rarely be able to penetrate even the weak screen which he leaves behind, whereas our screen, relatively strong as it may seem, will, in fact, be tactically speaking weak at all points and strong nowhere, and at the mercy of a strong concentrated hostile cavalry mass, which will rend it asunder and deal with it in detail.

If these facts were realized we should see less often than we do such orders as "the cavalry will screen the movements of the force and discover those of the enemy's columns," or "will seize and hold the line so-and-so, and discover the movements of the hostile columns," orders which impose on the cavalry the mission of screening and reconnoitring at one and the same time, and result as often as they are issued in failure to carry out either satisfactorily.

It is no doubt a comfortable thing for the marching columns to feel that they are moving, as it were, within a mosquito curtain of their own cavalry, but it is well to remember that such a curtain is just as vulnerable to all except mosquitos as the domestic article is itself.

It is sometimes said that cavalry leaders take Section 144, Cavalry Training, too literally, and go forth on such occasions with no other object but to do battle with the hostile cavalry masses, and thus, according to the favourite phrase, "neutralize each other." Nothing is further from the truth. They go forth with the intention of taking the shortest route to where they will be able to supply answers to the questions asked of them by the Commander-in-Chief, and if the opposing cavalry choose to operate wide of them, they do not leave their mission to seek combat with him; but they also know

that the more vital the information asked of them, the more certain is it that on their way to obtain it they will encounter, not only the heavy masses of the hostile cavalry, but also his protective screen. Both imply fighting, and fighting demands concentration.

Next as to question (a) 2. How am I to distribute my cavalry for this duty, *i.e.*, how many am I to allot to it?

Do not think if you are a junior officer who may not have to deal for a long time with large bodies that the answers to these questions do not apply to you; in dealing with small forces of all arms you will have to supply answers to just the same ones, and the same arguments apply in each case.

In the case of large armies, in our Expeditionary Force for instance, this question is answered by our organization, which provides for separate bodies of cavalry for the cavalry division, the protective mounted troops, and divisional mounted troops. This distribution is, however, quite elastic, and a commander may find that the situation is such that he requires more protection and less strategic reconnaissance, or *vice versa*, and will strengthen one body at the expense of the other as the situation demands. How can we answer it in the case of smaller forces? Does Field Service Regulations help? Yes, it does, but it is curious how seldom the paragraph in question (Field Service Regulations, Section 65) seems to influence the minds of officers confronted with the problem, in spite of the fact that it is printed in heavy type.

It reads: "The fundamental principle in the distribution of cavalry is that the Commander-in-Chief in order to gain full value from that arm *must clearly decide what he requires of it* and group his units accordingly in a suitable manner and in sufficient strength." The italics are mine.

To this supremely important pronouncement I would venture to add that it is no use considering what you require of your cavalry until you have made up in your mind a plan of campaign, a clear idea of what you intend to do, and mean to stick to it. I think perhaps it is through failure to do this that so many hesitate to make a bold distribution of their cavalry; they are playing too often a waiting game; they hope that what they hear about the enemy will give them an inspiration, and that things will smooth themselves out as they go along. They enter upon the operation with no determination to impose their will upon the enemy, but rather with the idea of parrying his blows until they see a chance. The chance will seldom come in war; such an attitude of mind has never succeeded yet, and never will.

Make up your mind definitely what you intend to do and determine to go straight for it. Then ask yourself the question: "In view of what I intend to do, which is the most important? That my own movements should be screened, that certain lines, features, or

areas should be seized and held, or that I should have absolutely definite information of the movements of the enemy?" The answers will vary according to circumstances, and if your mental vote goes in favour of information, spare as much of your cavalry for it as possible, for remember that while other missions usually imply delaying and defensive tactics, information demands offensive action.

It is sometimes said with truth that a commander is supplied by his general staff and intelligence with so much information as to the strategical disposition of his enemy, before he moves, that strategical reconnaissance to discover the position and movements of their columns is hardly necessary. That may be so, and in that case such reconnaissance will take the form of confirming a commander's appreciation of the intentions of his enemy. It may also be that the boldest course a commander can take may consist in taking up a defensive attitude from the first, in which case he may find it necessary to use the majority of his cavalry to seize and hold certain lines or areas of country. He may indeed have no choice in the matter. In such cases confirmation of his appreciation of the enemy's intentions will have to be left to detachments.

Now as to question (a) 3. How am I to put my reconnoitring demands before the cavalry in the form of orders? In Field Service Regulations, Part I, Chapter 2, the question of orders is dealt with at considerable length, the amount of space devoted to them being an index to the great importance of the subject. It might, indeed, seem almost presumptuous to enlarge on what seems to have been treated so fully, but there are a few considerations which apply to orders dealing with reconnoitring cavalry which it is essential to be clear about if the best results are to be expected, and which Field Service Regulations does not directly deal with.

Field Service Regulations, Section 12 (2), lays down that the recipient of an order should be told no more than he requires to know, and nothing that he could or should arrange for himself, while the method of attaining the object should be left to the utmost extent possible to him.

Again, Section 12 (6), at first sight rather seems to indicate that the Commander-in-Chief should be chary of communicating his intentions to subordinates, but this is qualified, in heavy type, by the remark: "Only so much should be stated as it is really necessary for those to whom the order is issued to know, for the purpose in view."

How do these paragraphs apply to cavalry destined for reconnaissance?

If it is the case, in orders dealing with the movement of heavy columns, or their disposal at the halt or in battle, that the recipient requires to be told nothing that he could and should arrange for himself, how much more should this warning apply to cavalry who,

a short time after moving off on their mission, may not only be to a large extent out of direct touch with the man who issued the order, but may also find that the situation as outlined by him is either not what he thought it was or has materially altered meanwhile. Yet it is one of the commonest mistakes in orders to reconnoitring cavalry, more especially perhaps in the case of small forces, for the commander to presuppose in those orders an exact situation which he has no reason to believe will obtain a short time ahead, and further, for him to give the most precise and detailed instructions to his cavalry commander as to the manner in which he is to act while engaged on his task, even to the way in which he is to subdivide his command and the exact route he is to take.

The instructions as to the giving of only so much information to the recipient as is really necessary for him to know for the purpose in view are quite properly strongly insisted on in the ordinary operation order to a mixed force. It is obviously neither necessary nor desirable that marching columns, or any body of troops in close touch with the headquarter staff, should know much of their Commander-in-Chief's mind, either as regards his own intentions or his appreciation of the probable action of the enemy. But in the case of cavalry, flung out it may be many miles in advance, and whose commander may have to make at any moment an independent decision fraught with important consequences to the force as a whole, it would seem obvious that a Commander-in-Chief who expects such a decision to be made for the best, must to a very large extent take his cavalry commander into his confidence, both as to his intentions and as to his opinion of those of the enemy. How far such confidences may be communicated to subordinates he must clearly state, and in any case they are never put into operation orders or instructions. It seems clear that when the cavalry do get into touch with the heavy columns of the enemy, its commander's action is bound to be largely influenced both as to his future movements and the steps he takes to communicate his discoveries to headquarters by whether, when found, the enemy are doing what he knows his Commander-in-Chief expects them to be doing, or something quite different. Such confidence is, in fact, necessary to enable a cavalry commander to judge of the relative importance of the information he has gained.

In operation orders to a force it is usual, therefore, to devote a paragraph to the information that a certain portion of the cavalry are employed independently under separate instructions, and to embody the tasks set to them in a separate document called "Instructions to the cavalry," while the cavalry commander is taken as much into the confidence of the chief as the latter deems necessary, either by word of mouth at a personal interview, or in a separate "secret" memorandum.

The form that instructions to the cavalry should take is of the

utmost importance, and a commander to obtain the best results must bear in mind the following facts:—

Vague missions are bound to have vague results. Such favourite phrases as “clear up the situation,” “reconnoitre towards the north,” convey to the cavalry that the chief is not quite certain what he wants to know, and consequently produce uncertainty as to their action and indefinite results.

The more definite the mission the more definite will be the resulting information.

“Is the enemy at A?” “Has the enemy crossed the frontier between A and B?” and so on, leave no doubt in anyone’s mind; they present definite tasks, and do, and always will, obtain definite results whether the answers to them be positive or negative.

If more than one mission is entrusted to the cavalry their instructions must leave no doubt in the mind which is the most important and must be carried out first and without fail, provided that circumstances preclude their being undertaken simultaneously.

The best way, whenever possible, to obtain definite information from the cavalry, and the way which is most agreeable to them because it leaves no doubt in their minds as to what is wanted of them, is to put as many of your requirements as possible in the form of questions to which an answer “yes” or “no” can be given.

Do this whenever you can, give them as many men as you can spare to carry out the task, and leave them to do it in their own way. They know how to set about it, and they know how their opponents will try and stop them. Do not, therefore, cramp their action by trying to “control the ship from the shore.”

When giving cavalry their reconnoitring missions do not over-rate their marching abilities, especially at first. Unfortunately, on mobilization they will have to deal with a certain number of horses new to the work and none too fit, and reservists on them none too secure or skilful in the saddle. Horses recover from over-exertion and exposure far slower than men. It is quite usual to find on staff tours the independent cavalry given missions which involve marches of 35 to 40 miles in large bodies on the first day, while in the case of patrols the distance they are required to cover is often outside all bounds of possibility.

A reconnoitring squadron can be responsible at the outside for 10 to 12 miles of front, while the distance they can cover in a day would be seldom more than 35 miles, while patrols at a pinch may cover 45; but if you ask them to do more, or the cavalry masses to cover more than 25 to 30 miles in a day, be very sure that the object you have in asking them to do so is so vital to the success of the force as a whole that it is worth the loss of efficiency it is bound to entail.

In any case it is well, if possible, to consult your cavalry leader

and ask his expert advice as to what distances his command is in a state to cover.

Let us pass to question (b). What can I demand of my cavalry in the matter of protection?

Field Service Regulations, Section 65, lays down that the mounted troops of an army form the chief means at the disposal of its commander for obtaining information and for protecting his advance, and divides them into three distinct bodies—the independent, the protective, and the divisional cavalry. In our organization the protective mounted brigades will in most cases consist of two parts of mounted infantry to one of cavalry, accompanied by Royal Horse Artillery.

Field Service Regulations clearly lays down the duties of protective mounted troops :

1. To afford the commander timely information as to the enemy's approach.
2. To furnish information regarding the tactical features, the roads, and resources of the country in advance of the main body.
3. To oppose hostile enterprises and prevent the enemy obtaining information regarding the movements of the columns in rear.
4. To seize and hold positions in front of the slower-moving infantry and deny their occupation to the enemy.

These troops are termed the "first line of protection," the second being, of course, the advanced, flank, rear guards, and outposts, assisted by the divisional cavalry, which latter help them in the immediate and close protection of the columns, whether on the march or at the halt, keep up communication with the first line of protection, and act as orderlies, &c., to the bodies to which they are attached.

The actual conduct of the first line of protection does not come within the scope of this paper. It is not an easy task, and although the methods that would be employed are well known to cavalry leaders, they have never had an opportunity of practising them on a large scale, because the small size of the forces which we are able to employ, even on army manœuvres in this country, prevent sufficient cavalry being spared for this work.

In large forces, as we have seen, the distribution of the cavalry is provided for in our organization, and the duties of both protective and divisional cavalry are very clearly laid down.

In smaller forces sufficient cavalry cannot be spared for a properly organized first line of protection, and we have to rely on the divisional cavalry, or in smaller forces still on what we can spare from our reconnoitring cavalry, to keep us informed as to the happenings in our immediate neighbourhood. That we must spare some for such work is obvious; how many, depends in each case on our answer

to the questions which we put to ourselves when considering the numbers we would allot to the service of reconnaissance.

In such cases commanders must realise that the protection afforded by such small bodies will consist in giving warning only, and cannot possibly include the resistance, which would, of course, be expected of the protective cavalry of large forces.

The first line of protection of a large force would normally move from half to a full day's march in front of the body it protects. In smaller forces commanders have naturally to be content with much closer work. In such cases the map must be read in conjunction with the situation, so far as it is known, and the cavalry at disposal used with a wise economy to ensure that the force shall not "blunder into" obvious danger points until the latter have been searched. Such danger points being defiles, close, involved, or wooded country, passages of rivers or mountain ranges, main roads leading from the direction of the enemy, &c.

In dealing with cavalry employed on protective work, whether it be on a large or small scale, it is essential for commanders to realize how entirely they differ from cavalry employed on independent missions. The nature of their duties calls for a large degree of dispersion, and imposes on them defensive tactics. Their every movement depends, not on those of the enemy, but on those of a slow-moving force behind them. They are in close touch with it, and exist only to serve its immediate needs. The demands, therefore, of the commander are conveyed to them in a different form, orders of a detailed nature in place of broad instructions. It is not sufficient to say to them "protect me" and leave the rest to them. Their task must be clearly defined, their day mapped out, the length of their marches, the time they are to be at certain places, or by which certain tasks are to be performed, when and where reports are to be rendered, all must be in black and white.

Certain lines of country or natural obstacles are to be held, by a certain time, for a certain time, certain places or areas are to be searched and reported on by a certain hour, and so on. Likewise, in their distribution, so many men are to accompany the advanced, rear, and flank guards, so many detailed for other tasks; freedom is accorded to them only in the actual manner they carry out what they are ordered to do.

I would beg commanders to remember that there is no work that is harder on, and takes more out of cavalry, than this close protection of slow-moving columns. The cavalry are tied to certain roads, strictly limited to times and distances, cannot choose their own time for such essentials as watering, feeding, and off-saddling; they must be active while the column rests, and they are usually far longer in the saddle than if they were with cavalry acting alone. Commanders are more often than not insatiable in their demands for patrols, and weaken

the already small numbers available by employing a ridiculous number of orderlies. At night, too, when the employment of an orderly or two with each picquet is all that is necessary, and mounted men are only an encumbrance and a source of embarrassment, large numbers are sometimes detailed to the outposts regardless of the fact that while a man can obtain sufficient rest almost anywhere wrapped in his cloak and be ready for instant service, horses obtain none, and lose efficiency rapidly if kept saddled and linked together, as they must be if employed in the outpost line. Employ as few horsemen as possible at night and you need then have no compunction in asking them to search closely and thoroughly the surrounding country at the dangerous hour of dawn.

It would hardly be possible in these latter days to discuss cavalry detached duties without referring to the possible effect of the new weapon of the air. Enthusiasts declare that the aeroplane does away with all necessity for the employment of cavalry on reconnaissance, who will, they say, be employed on protective duties only, or take their place with the marching columns and be reserved for use in battle.

That they will be an invaluable adjunct to cavalry and an extra eye to the chief command I do not doubt, but even when they become, which will not be long, as safe and reliable as motor cars, their usefulness will still depend on a new factor in war—the command of the air.

To-day, when an aeroplane passes high over the heads of troops, with an observer quite at his ease taking close notes of every detail of what he sees below, one is apt to jump to the conclusion that in future wars the term "fog of war" will be a figure of speech only; and if both sides are equally well served the campaigns of to-morrow, instead of being conducted with a curtain between them, will resemble a game of chess where all the pieces are visible to both players.

But this can hardly be so. The occupants of air-craft, at any rate till one side or the other has gained the mastery of the new element, will surely be very fully occupied in avoiding or attacking hostile aeroplanes; and their notes of terrestrial happenings, in such circumstances, will be apt to be disjointed and unreliable in the extreme.

I imagine that most commanders, no matter how reliable such craft becomes, will hesitate to depend entirely on them, at any rate, until they have ceased "battling in the central blue." They will no doubt, as every new weapon has done, modify existing practice. They may result in the cavalry being able to dispense with providing their best men and horses and risking their most valuable officers in long-distance patrols. They may result in cavalry being kept much more concentrated, more in cotton wool as it were. They may cause the marching and halting conditions of heavy columns to be more uncomfortable than they are at present, by compelling important moves

to take place at night, and forcing all troops to seek concealment by day in woods, towns, villages, and other places which render accurate observation from above difficult. In battle it may become a drill movement for large bodies, reserves, and such like, to lie down flat and motionless on their faces on the distant appearance of an aeroplane. That they are very much to be reckoned with is obvious, but I cannot think that the prudent commander will, until his own air craft have swept the sky, dispense with cavalry as a means of information.²

(To be continued.)

² The French views on the subject of aeroplanes and cavalry will be found on p. 497 of this number of the REVIEW.

V.

THE PROPOSALS OF THE NATIONAL SERVICE LEAGUE.

By COLONEL A. KEENE, D.S.O.

"Gentlemen, I shall now speak to you as an Englishman. If ever war was again to take place, I would send every ship and every regular soldier out of the Kingdom, and leave the nation to be protected by the courage of her sons at home."—(NELSON, 1802, recorded in the "History of Monmouthshire.")

THE proposals of the National Service League are based on the assumption that the object of the force maintained for home defence is to enable the Expeditionary Force and the Navy to be sent away from the United Kingdom without delay, in case of necessity. The League further maintains that in these days of nations trained to arms on the Continent of Europe, we require a larger and more highly-trained force than the Territorial Army before we can give to our Navy and our Regular Army the freedom of action demanded by Nelson.

With this short prelude, readers of THE ARMY REVIEW are invited to consider the proposals submitted by the National Service League for improving upon the present arrangements in such a manner as to provide national security at a reasonable expenditure.

In the first place the League suggests that military and physical training shall be compulsory for all youths between the ages of 14 and 18, and such training shall be carried out either (a) as part of the curriculum of all secondary and public schools, or (b) in affiliated cadet corps, or (c) in organizations for boys' training duly selected and authorized.

It will be seen at once that every effort is made to retain existing organizations, the object of the League being to give to those institutions and organizations which have been evolved under the voluntary system the strength and permanency which would be derived from the support of the State. Some of our secondary and public schools have already units of the Officers' Training Corps; let us have them in all such schools, and let all the boys at those schools be made to take military training in these units. Similarly, let us support the affiliated Cadet Corps, the Boy Scouts, the Church Lads' Brigade,

and all similar organizations for training lads, and make it compulsory for every lad, whose physique enables him to do so, to drill or train in one or other of these organizations.

It is not easy to estimate the cost of this training. The only definite statement which we have at present is contained in a letter from Lieutenant Steevens, who wrote as follows from the Cadet Headquarters, Wellington, New Zealand: "A New Zealand junior cadet can be clothed, equipped, and trained for 10s., approximately, per annum."

The number of boys who attain the age of 14 every year cannot be accurately stated until the results of the census of 1911 are more fully published. But if we take it at 450,000, we shall probably be not far from the mark. Taking this number and deducting 50 per cent. for exemptions for medical and other reasons, we arrive at 225,000 as the number of boys coming on for cadet training annually, and this, for four years after allowing for waste, means a total of about 850,000 who would go through cadet training every year. At 10s. a head this would cost £425,000.

For adult training the proposals of the League are as under:—

(1) One continuous training of four months for the infantry (with longer periods, not exceeding two additional months, for the other arms) shall be compulsory on all able-bodied youths in this country between the ages of 18 and 21, without distinction of class or wealth. Such training shall be followed annually by a musketry course¹ and a fortnight's training in camp for the next three years in the ranks of the Territorial Force.

(2) The men thus trained shall be liable to be called out for service in the Territorial Force, for home defence only, in a time of grave emergency, so declared by Parliament, up to the age of 30.

NUMBERS.

The number of lads reaching the age of 18 in any one year in the United Kingdom is (according to the census of 1901) about							416,000
In estimating the number who would come up for annual recruit training we must deduct 48 per cent. for medical rejections and legal exemptions							200,000
Recruits for Navy and Marines	...	...	...	...	...	...	8,000
Recruits for Regular Army...	...	...	...	...	...	...	35,000
Emigrants	...	...	...	...	...	...	10,000
Mercantile Marine	...	...	...	...	...	...	15,000
							268,000
Leaving to be trained each year	...	...	...	...	...	...	148,000
Say 150,000							416,000

¹ With such drills as may be prescribed for the Territorial Force.

The number of British emigrants in 1907 was just under 200,000 (see Board of Trade Return for Emigration and Immigration, 1907). We have taken 5 per cent. of the number as the proportion of able-bodied youths of 18. The number of British sailors in the Mercantile Marine is about 180,000, and it may reasonably be assumed that some 8 per cent. of these are youths of about 18 years of age.

Under the above assumptions the numbers trained annually would be as follow, allowing 5 per cent. for the annual wastage :—

Recruits' training	...	...	...	...	150,000
Training in first year	...	...	...	142,000	
Training in second year	...	...	...	135,000	
Training in third year	...	...	...	128,000	
Or roughly,	400,000			————	405,000

The estimate of cost is based upon the answer given to Mr. Arthur Lee by Mr. Haldane on the 14th December, 1908, with regard to the cost of the Special Reserve. The answer was as follows :—

Mr. Haldane (Haddington) : The estimate of £27 19s. 6d. includes barrack accommodation, clothing, pay, bounty, messing allowance, provisions, equipment, arms, ammunition, and charges for travelling, fuel and light, enlistment expenses, barrack stores, and all other expenditure which can be regarded as personal to the man. It does not include any portion of the cost of the establishment of Regular soldiers assigned to a Special Reserve battalion. The average cost of an infantry private of the Special Reserve after his recruit year is about £9 a year.

NOTE.—Mr. Haldane's estimate, £27 19s. 6d., for recruit's training of six months includes £1 10s., bounty. The actual cost of training for six months would therefore be £26 10s., or £22 for five months.

The estimated £9 per annum after the recruit's drill includes £4 bounty. Deducting this we get £5 as the cost of the 15 days' training.

It will be seen from the above that no allowance is made for the officers and non-commissioned officers who carry out the training of these Special Reserves. Consequently we have to estimate this cost.

Fifteen Regular officers, 75 Regular non-commissioned officers, and 20 Territorial officers are allowed in this estimate per 1,000 men.

We have, therefore, to add the cost of 2,250 Regular officers, 3,000 Territorial officers, and 11,250 non-commissioned officers. The cost is calculated as follows :—

	£	s.	d.	
For each Regular officer	...	466	10	0 } (Army Estimates, including
For each non-commissioned officer	...	80	0	0 } non-effective pay.)
For each Territorial officer	...	50	0	0

The above calculations deal solely with officers required for the recruit training. We must allow 35 Territorial officers per 1,000 men for the 15 days' annual training of the Territorial Army (400,000). The cost of these officers is calculated at a proportion of £300, which is the effective cost of an officer under the Army Estimates (excluding non-effective vote).

From the total cost of the recruit's training we deduct 6*d.* per diem, as Mr. Haldane's figures given above are based on the pay given at present to a Regular soldier.

Estimated cost of stores, horses, &c., administration, and retaining fee must be added. Deductions are also made for the present cost of the Territorial Force and Special Reserve.

These Estimates give the following results:—

	£	£
1. 150,000 recruits at £22	3,300,000	
2,250 Regular officers at £466 10 <i>s.</i>	1,049,625	
3,000 Territorial officers at £50	150,000	
11,250 non-commissioned officers at £80	900,000	
	<u>5,399,625</u>	
Deduct 6 <i>d.</i> per diem for 150,000 recruits	562,500	
	<u>4,837,125</u>	
Total cost of recruits' training		4,837,125
2. 400,000 Territorial Force at £5	2,000,000	
14,000 Territorial officers at £13 (one twenty-fourth of £300)	182,000	
	<u>2,182,000</u>	
3. Armaments, stores, horses, &c.		500,000
4. Administration		200,000
5. £1 10 <i>s.</i> retaining fee for 80,000 men ²		120,000
		<u>7,839,125</u>
Add 10 per cent. for contingencies		783,912
		<u>8,623,037</u>
Gross total		8,623,037
Deduct cost of Territorial Force	3,515,000	
„ „ Special Reserve	1,301,665	
	<u>4,816,665</u>	
Net total additional cost of Territorial Army under the League proposals		<u>3,806,372</u>

We see then that the proposals of the League would give us a Home Defence Army of 400,000 men, exclusive of 150,000 recruits undergoing training. The trained soldiers would consist of the pick of the population, every one of them would be known to be over the age of 19, and all would have received a training which should enable them, with a numerical superiority of three to one, to deal decisively with any invading force that is likely to land on our shores.

² These 80,000 men to receive a retaining fee in return for engaging to serve abroad with the Regular Army in time of war as the present Special Reserve men do.—A. K.

These estimates have been disputed by the War Office, but not only are they based on War Office figures, but they can be substantiated by the same. Soon after the Report of the Norfolk Commission was published, Mr. Arnold Forster, who was the Secretary of State for War, presented to Parliament Command Paper 1909 of 1904. In that paper, the "Cost of a Conscript Army" was given at £27,530,000, the basis of the estimate being a year's training for 380,000 men. This number included every young man who would reach the military age in a given year. Mr. Arnold Forster tacitly admitted the absurdity of assuming that every lad would be physically fit for military training, for, in a footnote to his paper, he said that the cost of training 190,000 men for one year would be £13,765,000. Working on this basis we can calculate, by rule of three, that the cost of training 150,000 for five months would be £4,527,960. But the League has taken £4,837,125 as the total cost of recruit training—see above—and making allowance for the fact that the two calculations are not exactly on the same basis, though nearly so, the similarity of the results gives strong proof of the substantial accuracy of the estimates drawn up by the League.³

PROVISION OF TRAINING STAFF.

One of the main difficulties in starting national service will be the provision of an adequate training staff. Considerably over 2,000 Regular officers will be needed, and the question naturally arises: "Where are they to come from?"

The difficulty is a great one, but let us take heart from the fact that within nine months from the time they received Lord Kitchener's advice, the Australians doubled their staff of instructors. The bulk of these men came from the officers and non-commissioned officers of their existing forces, *i.e.*, the Militia and Volunteers, and after undergoing a thorough training for six months they were found ready to proceed with the training of the Senior Cadets. For the officers of the Permanent Training Staff we should have at the start all those officers who are now training the Special Reserve. Then there are many retired officers who have left the Regular Army at a comparatively early age, who would no doubt come forward gladly for so congenial a task as soldiering at home in billets which would allow them to remain in one place. The National Service League has many retired officers working for it, and the much-sought-after post of Organizing Secretary for the League is one which, though carrying little pay with it, demands higher all-round qualities than those needed for an instructor of recruits, and involves much more arduous and continued application.

³ The League estimates ask for 35 officers and 75 non-commissioned officers per 1,000 men, Mr. Arnold Forster's for 30 officers and 70 non-commissioned officers to 900 men, which equals 33 officers and 77 non-commissioned officers per 1,000 men.—A. K.

There would certainly be many applications from Regular officers for posts in the Training Staff of a National Army, because these posts would have the great advantage of enabling the poorer men to serve at home, and they would free officers from the terrible expense of constantly changing quarters. The problem would then arise—how to replace these officers if they left the Regulars? This brings us to the general problem of the supply of officers for the Army. Probably it would be found necessary to make promotions on a large scale from the ranks in order to provide officers for the training of the recruits. In all probability this would give us very suitable men for the work, and it would have the effect of popularising the introduction of universal service.

As to the provision of non-commissioned officers—this is the best part of the whole reform. There are nowadays never more than 135,000 Regulars all told in the United Kingdom, so that the provision of a Training Staff for 150,000 men would about double the number of well-paid posts in the Regular Army, to which an able, ambitious and well-conducted young man could rise. The fact of over 11,000 additional billets, all in the British Isles, and all permanent and stationary, being provided would do more for recruiting for the Regular Army than all the recent improvements in pay and general conditions of service, such as better barracks and less harsh discipline.⁴

THE PROVISION OF OFFICERS FOR A NATIONAL ARMY.

We now come to the question of how the officers are to be found for the improved and enlarged Territorial Force which would be provided if the proposals of the National Service League were adopted. It has been stated above that all lads between the ages of 14 and 18 should be compelled to undergo military training. If this were not necessary for any other reason, it would be needed in order that all lads should have a reasonable chance of qualifying for appointment as officers in the National Army which is required to give us national security.

It is proposed then that all candidates for commissions must undergo military training from the age of 14 to that of 18, and obtain during those years (a) an educational certificate, the exact standard to be determined by the authorities of the time, but sufficiently high to ensure the suitability of the candidate to hold an officer's commission; (b) a certificate of military efficiency equivalent to Certificate A of the present Officers' Training Corps.

⁴ The six sergeant-instructors for the *Spectator* Experimental Company were got together in a few hours by the National Association for the Employment of Ex-Soldiers. That Association alone could supply many hundreds of men suited for the Permanent Training Staff of our National Army, on the pay and allowances suggested by the National Service League.

On reaching the age of 18 the candidate must do his four to six months' recruit training for the Territorial Army in a training brigade, battalion, &c., as the case might be, under the same conditions as any other youth. During this training he must rise to, or be recommended for, the rank of sergeant, and at its expiration be recommended by his commanding officer for further military training as a probationary officer, such further training being undergone either for one year in an Officers' Training Corps, or for six months in a training brigade, battalion, &c.

At the expiration of this probationary training he must be recommended for officer's rank by his commanding officer.

Those candidates who fulfilled the conditions enumerated above should be appointed officers as vacancies occur. The military authorities should, however, have the power to promote to the rank of officer, independently of these qualifications, for very special reasons.

Officers would serve in the active Territorial Army for the same period as the rank and file, viz., for four years, the periods of recruit and probationary training counting towards this time. At its expiration their compulsory service in the active Territorial Army would terminate, but those desirous of serving on would be allowed to do so at the discretion of the military authorities at the time. It would be for those authorities to decide how far such extension of service was desirable, and whether any official inducement should be offered.

Those who did not extend would pass into the Reserve of Officers, with the liability to be called up in a time of grave emergency, and for home defence only, up to the age of 30.

Taking the total strength of the Territorial Army, exclusive of recruits in training, at about 400,000 men, 14,000 officers would be required, of whom 8,000 would be subalterns and 6,000 in the higher ranks. To this must be added the 20 Territorial subalterns per 1,000 men engaged in training the 150,000 first-year recruits, or 3,000, making a total of 11,000 subalterns and 6,000 officers in the higher ranks. To supply these the Sub-Committee have calculated that 5,000 officers would have to be appointed annually.

The estimated cost of these proposals is put as under :—

	£
Cadet training	425,000
Probationary officers—	
Training in Officers' Training Corps	37,500
Training with Training Brigades, &c.	62,500
	525,000
Deduct sum now spent on Officers' Training Corps (as per Army Estimates)	81,000
Total	444,000

Or say, in round figures, £500,000.

It must be remembered that this last item cannot fairly be charged as one more additional expense due to the introduction of universal service. The weakest point in the voluntary system is its failure to provide officers; these must be got somehow, and it is not fair to charge the cost of getting officers against the compulsory system, merely because the National Service League has endeavoured to formulate a working plan for getting officers.

The above is an earnest effort to put forward the claims of National Service, to indicate its cost, and to offer suggestions as to the provision of officers for the training and for the leading of a National Army, based on the excellent organization of the Territorial Force.

No one realizes more fully than do the members of the National Service League the very great improvements which have been made by the War Office authorities in the matter of organization. We believe that the country can mobilize and maintain in the field a larger force than it ever could before. We accept absolutely the organization of the Territorial Force, and we admire the spirit of the officers and men who offer themselves for training in that force.

But while we admit these improvements and admire the skill of the men who have introduced them, we are very anxious to strengthen the hands of the War Office by pointing out how very much yet remains to be done before we are ready "to speak with our enemies in the gate."

We believe that the proper function of the Territorial Force is to give immediate strategic freedom to our fleets and to our Regular soldiers on the outbreak of war, and we are convinced that the Territorial Force cannot do this unless it is much stronger in numbers than at present, unless the men composing it are more highly trained, and unless their war training is carried out before, and not after, the fighting has begun. These indispensable improvements to the Territorial force cannot, as experience has proved over and over again, be attained under the limitations imposed by the voluntary system.

VI.

FRONTAGE, EXTENSION, AND DEPTH OF FORMATIONS IN ATTACK AND DEFENCE.

[NOTE.—This memorandum was prepared by the General Staff, when Chapter VII, Field Service Regulations, Part I, was being drafted. It is published here as it explains more fully than it is possible to do in a manual the principles on which Secs. 104 (3) and 108 (5), Field Service Regulations, Part I, are based.]

1. The question of the frontage to be allotted, in attack or defence, to a body of infantry, or of infantry combined with other arms, presents a problem of great difficulty. It is a problem which arises in every tactical situation. Its solution must vary with circumstances, and must depend on a just appreciation of many inconstant factors, the relative value of which must often be a matter of surmise. Ground; time conditions; the possibility of gaining a surprise; what is known, or surmised, of the enemy's dispositions, of the character and methods of his commander, and of the relative fighting value of the opposing troops—these are the chief factors to be weighed in solving the problem. The solution demands the exercise of the highest art of generalship, for not only is the problem very difficult, but it is on its correct solution that the possibility of a timely development of superior force at the decisive point mainly depends, since, when opposed by equal or superior numbers, it is only by economizing men, where it is reasonably safe to economize, that it becomes possible to develop a superiority elsewhere.

2. In attack, the bold and resolute action of a comparatively small force against the enemy's front may suffice to pin him to his ground, without undue risk, when the opposing commander is known to be irresolute, or when his troops are judged incapable of executing well-combined and rapid local counter-attacks, or when the ground is very favourable to the attack, or when the decisive attack is to be launched very early in the battle—thus hastening the final decision. Under such conditions a maximum force may be made available for the decisive blow. On the other hand, when the conditions to be dealt with are the reverse of the above, it will generally be necessary to employ a strong force against the enemy's front in order to convince

him of danger there, to resist his counter-attacks, and to wear down his powers of resistance so that he may be incapable of meeting the final blow when it strikes him.

3. When holding a position with the object of developing a counter-offensive, as strong a force as possible should be employed in the decisive blow. But, until the result of that blow becomes evident, it will usually be necessary to retain secure hold of the position itself, as a pivot of manœuvre. A sufficient force must, therefore, be allotted for the latter purpose. What constitutes a sufficiency for this is a matter of estimation, depending on the capacity of the ground for defence, the intended timing of the counter-attack when this can be foreseen, the facilities for launching the counter-attack and for driving it home, the character of the enemy and of his commander, the information available as to the enemy's dispositions and intentions, and other inconstant factors, of which the relative powers of endurance of one's own troops is not the least important.

4. Both in attack and defence, it falls on the chief commander on the spot to weigh the various factors affecting the situation, and to determine the general frontage to be allotted to each body of troops at his disposal. As a rule, therefore, subordinate commanders will have the frontage of their respective commands regulated for them by higher authority. The chief commander must rely on military knowledge and judgment to enable him to gauge the situation aright. It is neither possible to lay down rules for guidance in solving this complicated problem, nor is it desirable to attempt to do so. Some assistance may be obtained, however, from the following figures, though they must not be treated as applicable to all circumstances.

5. When the utmost development of rifle fire is required, one man per yard may be taken as the maximum number that can be usefully employed in one line. A line of that density, composed of staunch troops, with a good field of fire, and with adequate artillery support, should be able to hold a position for several hours against a frontal advance of a considerably superior force. When the conditions are very favourable to the defence, as, for example, through protection from hostile artillery, or owing to the front being obstructed by obstacles situated under fire, a less dense line should be able to hold in check any probable attack, especially if the position has been well entrenched. In every case, human powers of endurance being limited, reinforcements should be available to replace casualties and to infuse fresh vigour into the defence; the strength of these must depend on the probable conditions of the fight, and may vary, roughly, from one-fifth to a half of the firing line.

When the field of fire is bad, when cover exists close in front of the position, and when the hostile artillery fire is heavy, there

will always be some danger of an attempt to rush the position. This danger is best provided against by local reserves, the strength of which may be estimated, roughly, at about equal to the firing line plus reinforcements as above.

On this scale, the numbers of infantry required for the defence of a position against frontal attack, excluding the force reserved for the decisive counter-attack, would work out at from less than one man per yard where the conditions are favourable, to about three men per yard where conditions are unfavourable; ¹ but with due allowance for the relative fighting value of the opposing sides, and for the probable prolongation of the defence. The stronger the force retained for the decisive blow the greater will be the chance of decisive victory, provided the position is adequately secured as a pivot of manœuvre. If, therefore, the total frontage occupied is so great as to reduce the striking force much below half the total force available, it may be considered that the position is too extended to be a good one with a view to decisive action.

For purely passive defence the striking force may be considerably reduced, and the frontage occupied may be increased proportionately.

6. In attacking a force holding a position, the guiding principles are that, usually, the enemy must be engaged all along his front, while as strong a force as possible must be allotted to the decisive attack. The higher the manœuvring power, boldness, and enterprise of the enemy are rated, the more closely must he be engaged along his front, and the greater will be the danger from local counter-attacks, as well as from the decisive counter-attack.

In the case of civilized armies, the probable strength of the garrison of the position, in the absence of any definite evidence, may be roughly gauged from the figures given in paragraph 5 above, which are in general accord with the views held in modern armies. The strength of the infantry force to pin the enemy to his position must depend on the various factors already mentioned. But, as a rough guide, it may be taken that against an adversary whose fighting value may be considered about equal, man for man, and with a slight superiority in the attacking artillery, a force fully equal in numbers to the estimated garrison of the position (excluding the probable general reserve) is the least that will be likely to produce the desired effect, and to be strong enough to resist local counter-attacks. Such a force, which should ordinarily be divided into firing line and supports, always with local reserves, would be disposed in unequal strength along the enemy's front, according to the nature of the ground, the frontage varying from one man per yard to three, or

¹ The distribution in detail of a force detached for the defence of a position would be arranged on the principles explained in *Infantry Training*, 1911, Sections 142 and 143.

more, according to circumstances. If the local reserves become used up in pushing in to effective fire positions, there will be danger in not replacing them. But to do so will entail reducing the force available for the decisive attack, and it will generally be preferable, if possible, to hasten this attack, rather than to reduce the strength of it.

7. The decisive blow, whether in attack or in counter-attack, should be made in sufficient force to drive it home. Against a strong adversary, the latest experiences go to show that not less than from three to five men per yard on the front of assault will be likely to prove sufficient, and that only after thorough fire preparation, unless the conditions are peculiarly favourable (*vide* paragraph 9, below, as to the preparation and delivery of the assault).

8. The degree of extension permissible varies with circumstances. One rifle per yard in a firing line is required to produce the maximum of effect. But in moving under fire, to gain a fire position, men may be moved in successive lines, extended, if considered desirable, up to four paces per man, or even a little more. It must be remembered, however, that widely extended lines, although they may minimize losses, seldom retain much impetus, and have comparatively little power of resisting sudden counter-attack.

9. Depth of formation is most suitable for manœuvring purposes, and it should, therefore, be retained as long as possible. But when once troops have been committed to a fight, the depth of formations must depend on the proportion between numbers and frontage, and on the object in view. Where it is not intended to push an attack home, the formation will usually consist of a firing line, probably with supports, and the local reserves in the hands of the various commanders. Where the attack is to be pushed home, the formation will generally be very deep at first; the rear lines closing on the front one in time to throw sufficient weight into the assault when the time for it comes. The actual density of the assaulting line in its final rush to close is open to doubt, and it must vary with circumstances. It is clear that it would be very disadvantageous to crowd too many men into the firing line before the time to deliver the assault arrives, and that time can seldom, if ever, be foreseen. Most frequently the favourable moment is realized first in the firing line itself, which rushes forward without waiting for reinforcement. When this happens, the reinforcements must be pushed forward rapidly to support and encourage those in front, to impress the enemy with the hopelessness of resistance, and to meet counter-attacks.

On special occasions, observers from points in rear of the firing line may observe symptoms of retirement which would justify the ordering forward of strong reinforcements to infuse fresh energy into the firing line, probably exhausted by the fire fight, and so to carry it forward.

In the face of modern fire it is very doubtful whether a very dense line can succeed in closing with the enemy under conditions which make it impossible for a less dense line to do so. But when the enemy's fire has been mastered sufficiently to make the final rush possible, it is beyond question that he will be less willing to await the bayonet attack of superior numbers than of approximately equal ones ; and that the moral effect of great numbers rushing towards him will shake his nerve, while it will encourage the assaulting line. Numbers should, therefore, be available opposite to the front of assault, but those not required to take part in the fire struggle prior to the assault should not be exposed to useless or premature loss while awaiting the decisive moment.

VII.

NEW TRAINING REGULATIONS.

A.—FIELD ARTILLERY TRAINING, 1912.

IT is proposed in the present article to call attention to the more important changes in Field Artillery Training, 1912.

The first point to notice is the considerable increase (about 100 pages) in the size of the book. It will not be out of place, therefore, to explain here why this expansion has been found necessary. It may be within the recollection of the reader that the question of the Military Defence of the Empire was considered in considerable detail at the Colonial Conference of 1907, and again at the Imperial Conference of 1909. As a result of the discussions which took place it was recognised that sea command, self-defence, and mutual support must form the basis of any sound system of Imperial Defence.

Now in order to carry out the latter object, it is evidently desirable to have a common system of war organization throughout the Empire, and whatever other difficulties the pursuit of this object may bring to light, the adoption of the same system of drill and methods of training becomes a primary necessity. This view having been accepted both by the Oversea Dominions and by the Government of India, the Field Service Regulations and Training Manuals, issued to the Regular Army, are henceforward to form the basis for the training of the troops throughout the Empire.

The needs of the Territorial Force have also to be remembered. The creation of this force took place subsequently to the issue of the last edition of Field Artillery Training and in no respect has there been a greater change in the organization of that force than in the provision of mobile field artillery.

Consequently, it became essential to include elementary subjects in the Manual, in order to save continual reference to other books, and also that the Manual might serve as a guide even when the time available for training would not permit entire adherence to the course of training outlined for the regular artillery.

The Manual divides itself into two parts. The first, which consists of chapters 1 to 6, deals with those subjects in which the individual soldier must attain a certain standard of proficiency before he is fit

to perform useful service ; the second treats of the higher training of the artillery with a view to its employment in war.

Chapter 1 deals with the principles of training, and contains not only what was to be found in the same chapter of the old book, but also part of chapter 9 which contained a collection of miscellaneous subjects. The responsibilities of the various grades of officers for training is defined, and amongst these it is laid down that the artillery brigade commanders should exercise direct supervision over the training in signalling, range finding, and artillery reconnaissance in order to ensure uniformity of system within the brigade. These instructions do not imply that the whole of the training of these men is to be carried out apart from their batteries, but that, at a certain period of the training season, they should be trained to work together under the brigade commander.

The division of the year into periods when the principal training will either be of an individual or collective nature is laid down, and a new section explains that the object of the annual course of gun practice is (1) to instruct all ranks in the application in the field of the approved principles of gunnery with service ammunition, so far as peace conditions allow ; and (2) to teach commanders to apply their fire correctly in various tactical situations.

No attempt has been made to lay down fixed courses of training, since not only do the conditions vary for the artillery in different parts of the Empire, but circumstances also make it impossible for batteries quartered in the United Kingdom to adhere to a rigid system. All that has been attempted is to point out the subjects which should be included in the various stages of training.

Chapter 2 is entirely new, but calls for little remark. It includes instructions for movement on foot, with and without arms, and contains only what is considered essential that the artillery should learn.

Chapter 3 deals with Equitation and Driving. It includes all that was contained in chapter 2 and part of chapter 11 of the previous edition. A footnote on page 18 of the 1908 edition contains the following sentence : " Instructions regarding training in equitation are contained in Cavalry Training." Hitherto, the methods of horse training followed by the cavalry have been accepted without question as equally suited to the artillery. It is now, however, generally agreed that at least 18 months are required to produce a trained cavalry horse, a period which it is virtually impossible for the artillery to devote to such work. Moreover, there are certain other aspects of the question which make it desirable to modify the course of equitation as laid down for cavalry. In the first place, the average artillery horse is of a very different stamp to that supplied to cavalry ; and in the second, the main object of the artillery being to get *their guns* into action, it is more important that its horses should be capable of work in draught than that they should be perfect chargers.

While, therefore, the general system of training as laid down in Cavalry Training has been followed, modifications have been introduced with a view to simplify the training for the artillery. The instructions for teaching driving have been amplified, and the drill connected with limbering up and unlimbering has been included in the chapter.

The principal changes in chapter 4, which deals with gunnery, are due to the introduction of the bar indicator, and the reduction of the angular height of burst of shrapnel from 15 to 10 minutes. This chapter no longer contains the five lectures with which the corresponding one in the old book opened, though the contents are still there. Lectures on practically the whole of the book are essential, and it was therefore illogical to include only one or two so-called lectures, the subjects of which were very closely connected with one another, and not to treat the rest of the book in the same manner.

The section in the former edition, which discussed distribution of fire, belonged more properly to the training of the battery and has been included in chapter 9.

The next chapter deals with laying and all that is involved by that term. The sections on parallelism of lines of fire and displacement have been re-written. The importance of the former question has been emphasized, since it is on its satisfactory solution that "the battery commander will have a definite condition from which to make his calculations, and should be able to switch his guns from one target to another without losing parallelism, to distribute his fire correctly over a given front, or to concentrate it on a given point."

The provision of the panoramic sight will, it is anticipated, simplify the work to be done and remove the chief cause of inaccuracy.

Admitting that formal drill is a necessary preliminary to manœuvre and to the production of cohesion and habits of instant obedience, it has been recognised for some years that it must not occupy more time than is absolutely necessary for the purpose for which it exists. Thus in the edition now superseded drill was cut down to a minimum, and the corresponding chapter in the new one follows the same lines. There are, however, two changes which are of some importance. The first is the introduction of a manœuvre formation for horse artillery, described on page 202. While this formation has been tried with satisfactory results at home, it may be found unsuited to more dusty countries, in which case the existing formation—which will still be used for ceremonial purposes in England—must be employed.

The second change is the holding of the battery leader's horse in action by an orderly who may be either a battery signaller, ground scout, or other mounted man. The object of this arrangement is to give the battery leader greater freedom and not to tie him so closely to the battery, as was the case when he had to hand his horse to a driver of one of the teams of his section.

Chapter 7 may be regarded as the opening chapter of the second part. It deals with the employment of the artillery in war, and forms the basis of the training in the two following chapters.

Under "General Instructions," with which the chapter commences, there is one very important sentence which lays down that the methods indicated are generally applicable to any force of artillery acting under one commander, whether the command is of a temporary nature or not. It follows from this that the artillery commander of any force will exercise for the time being many of the functions of a divisional artillery commander, and must be acquainted with the principles on which the latter's actions are based.

Four sections describe the general characteristics of the various forms of field artillery, and these are followed by five others, which are grouped under the heading "Principles of Employment." The first section deals with economy of force, the essence of which may be said to be not to employ more force, either as regards fire or numbers, than is necessary for the task in hand, so that a reserve may be available to meet unexpected developments or to overwhelm the enemy at a crisis. It is interesting to note that in France both Regulations and writers, and in Germany many of the latter, recognize the necessity for economy of force, yet both countries also teach the necessity for priority of occupation of positions by the artillery, and in superior numbers to the enemy. May this not be a relic of the time when open or only partly concealed positions had to be taken up, for how will it be possible nowadays to say when one is in superior numbers if the enemy is invisible? And is not the too early occupation of a position likely to commit the artillery prematurely?

Concealment, which is next dealt with, is closely connected with this question. Economy of force would, in fact, be almost impossible if batteries could not fire from under cover. Other advantages gained by concealment are that it increases the difficulties of the enemy and may afford opportunities for surprising him. In fact, until the recent rapid development of the aeroplane took place, it seemed likely that the principles of economy and concealment would gradually lead to greater caution in the tactical handling of the artillery. What the full effect of this new means of reconnaissance may be it is still difficult to say.

The next section (148) is headed "Objects of Fire," and should be read in conjunction with the two previous ones, for "to help the infantry to maintain its mobility and offensive power by all the means at its disposal should be the underlying principle of all artillery tactics," and, consequently, concealment must be foregone if such action will enable the infantry to effect its object. The following sentence, which is taken from a recent book by General Percin, puts the case in a nutshell:—

"Before all else the artillery must be placed so as to give efficient

support to its own infantry. To fulfil this task the first condition is the possibility of intercommunication. It is better to kill 10 men at the right time and place than 50 whose disappearance will not assist the progress of the attack. Between two positions, both of which are good for intercommunication, that one should be chosen which lends itself best to oblique fire; but the first condition of success must not be sacrificed to the second."

The next section (149) deals with protection. As a general rule artillery is protected on the march and in action by the distribution of the other arms. Every commander is, however, responsible for the protection of his command against surprise. And as artillery possesses its own patrols they should, when available, be employed on this duty. There is, however, this danger, that if the artillery patrols are used in addition to any regularly appointed escort, the duty of protection may be perfunctorily performed by both. The Manual, therefore, indicates the need for a clear understanding being come to by the artillery and escort commanders as to the use to be made of them.

The two sections (150 and 151) which follow are closely related, and deal, amongst other matters, with the question of intercommunication and temporary groupings of the artillery and infantry.

The conception underlying these sections is briefly as follows: The artillery of a division is as much a separate formation as one of the three infantry brigades. The latter may be employed on one or more tactical tasks. The assistance of the artillery is necessary to the accomplishment of these tasks. It follows, therefore, that the artillery of the division must be capable of subdivision according to the number of tactical operations on which the infantry is engaged.

For the effective pursuit of any given object, responsibility should rest with one man. Thus, where more than one operation is being carried out, the artillery and infantry associated for a distinct tactical task must, as a rule, be under one commander. At the same time, even when artillery is thus allotted, the divisional artillery general must be kept informed of its general situation and technical needs.

Consequently, from a tactical standpoint, artillery communications must generally include two distinct systems: (a) those which connect the divisional artillery commander and his subordinates; and (b) those between infantry and artillery subordinate commanders. This holds good even when the division is employed on a single tactical operation, for it is laid down in Section 151 (7) that a subordinate artillery commander is responsible for opening communication with the infantry commander whose attack he is supporting. It is sometimes maintained that the infantry end of this chain of communication should be in or close to the firing line. Information sent in from such a position, however, must be restricted to events taking place within a very limited area, even if the physical

difficulties of opening and maintaining communication can be overcome. On the other hand the subordinate infantry commander receives reports from the front, and is therefore in a position to decide where and when artillery fire is most needed.

In the following sections the action of the artillery in the various phases which attack or defence may assume are discussed. Throughout the whole of them the prevailing idea is how to assist or prevent the movement of the infantry. Thus, in the attack "the forward movement of the infantry is dependent largely on effective covering fire;" while on the defensive the fire should be of such a nature "as to impress upon the enemy the certainty of loss if he attempts to cross open spaces without deploying," or later "as to keep the hostile firing lines glued to the ground." Infantry, it is said, which has lost its power of forward movement, is no longer capable of forcing a decision, and this is a maxim which should be borne in mind whether the artillery is supporting an attack or acting defensively.

Included amongst these sections will be found two numbered 160 and 161 dealing with the action of artillery in local and decisive counter-attacks, and one (162) with night operations, subjects which in the previous edition had received very little attention.

Sections 165 to 174 deal with horse artillery and the procedure to be adopted both in support of cavalry shock action and when co-operating with cavalry acting dismounted. While the principles to be followed are in most respects the same as those laid down for artillery in the field in general, the methods to be pursued require modification owing to the more rapid development of a cavalry fight. The theory of such a fight is based on the conception of a mounted attack combined with a fire attack. For success the chief factors are the timely separation of the guns and the correct timing of the two attacks. Initiative, rapidity in decision, and swiftness in execution are, therefore, characteristics which it is essential should be possessed by horse artillery.

Chapter 8 deals with "Brigade Tactics." Exception may, perhaps, be taken to the title adopted. In the previous edition the handling of the brigade was considered under the headings of "Application of Fire," "Fire Tactics," and "Manœuvre;" while that of the battery was dealt with under the same headings, with the addition of "Fire Discipline," a term whose exact meaning, in view of the sections grouped under it, was not quite clear. It has already been pointed out that the aim of the artillery is to help the other arms. The question therefore requires to be approached from the point of view of combined tactics, and the action of the brigade or battery considered as one connected sequence of events from the moment it receives its orders. It is with the object of simplifying the work, and at the same time emphasizing the importance of the tactical idea, that the present arrangement has been adopted.

The following are the principal points in which the next chapter headed "Battery Tactics" differs from the corresponding one in the previous edition.

Under "General Instructions" it is laid down that the battery commander should be allowed latitude as regards the choice of objects within the task allotted to him. It will depend, therefore, on the brigade commander's distribution of tasks to what extent a choice is possible. If, for example, a battery is detailed to engage hostile artillery within a certain zone, it would normally be incorrect for that battery to engage any hostile infantry which might appear.

The same sequence of ideas is followed as far as possible in this chapter as in the previous one. Thus reconnaissance is first discussed and it is pointed out that if a position under cover is to be occupied the first object should be the selection and occupation of the observing station. To avoid confusion it may be advisable for the battery observing stations to be chosen, approximately, by the brigade commander, but it will rarely be possible for the latter to do more than this, and reconnaissance by the battery commander will, therefore, also be necessary.

In the same section the various types of position that may be occupied are defined as "open," "semi-covered," or "covered." These terms were not actually made use of in the last edition, though their relative advantages and disadvantages were discussed in a section headed "Concealment" (*see* Section 52, *Field Artillery Training*, 1908).

In the next section it will be seen that the method of occupying a position by the so-called "deliberate method" has been replaced by the "special method," which should only be employed when it is impracticable to occupy the position by the ordinary method. A slight modification has also been introduced into the ordinary method. It is now the duty of the officer actually leading the battery to halt it and give the order for action, while the officer who has selected the position for the guns marks a spot on their actual alignment. It is worth noticing that the practice abroad is to come into action *at a walk*, each gun on a selected spot.

With the object of shortening the words of command, certain abbreviations are laid down in the section on "Orders;" corrector settings are given out in the same way as telephone numbers.

Beyond drawing attention to the modification introduced for horse artillery, and the need for rapidity on the part of the battery captain in selecting the position of the wagon line, in order that he may be ready to direct the gun teams where to go as soon as they have unlimbered, the instructions regarding the advance for action and the methods of coming into action call for no remark.

Under the heading, "Duties of Officers, &c., in action," a paragraph has been added dealing with those of the captain, and another paragraph relating to the battery sergeant-major has been amplified.

Attention may here be drawn to an amendment which will be found in Section 197, where it is laid down that "the officer who observes and controls the fire from the observing station is the battery commander for the time being," thus obviating the need for the term "ranging officer."

Section 199 deals with the communications for the control of fire. A few additional signal abbreviations have been added, including some for the various howitzer charges.

In the sections dealing with ranging, the chief points to be noticed are the introduction of "collective ranging," which may be considered the normal method. In the case of six-gun batteries, this term implies ranging by the fire of half batteries alternately, and in a four-gun battery by the fire of all the guns. By this means it is anticipated that ranging will be more surely and quickly effected, since there will be little likelihood of all the rounds being missed, and consequently more certainty about establishing a bracket, while, with practice, correction for line and elevation will be carried out simultaneously. In addition, the moral effect of three rounds fired in quick succession is undoubtedly greater than rounds fired singly at appreciable intervals. As a general rule, ranging for fuze should be unnecessary. Some special instructions are added for howitzers and heavy guns.

Under the heading of "Distribution of Fire" are included general principles and special methods such as "sweeping" and "searching." The extent of target which a battery can cover with its fire without sweeping is laid down, and a table gives the angular measurement of 100 yards at various ranges. From these data the distribution or concentration required for any objective can be calculated, as shown in some examples which have been included. These sections lead up to others dealing with the "Method of engaging various objectives." The sections appearing under this head have been re-cast and now include instructions as to "registering a zone" and engaging "localities," "staffs," and "machine guns." They require careful study since they form the basis for applying the fire of the guns in any given tactical situation.

The examples of ranging have been cut down to a minimum. Those which are included are only intended to illustrate the methods of ranging. This course has been adopted since it is considered that the multiplication of examples is not only confusing, but also leads to neglect of the principles laid down for engaging different objectives and of the situation at the time. A further disadvantage is the inevitable tendency which exists to add to their numbers each year in order to include cases not previously covered.

Following the examples come sections dealing with change of position, of which a retirement is the most difficult operation. As a rule, the captain will be required with the wagons, and a section

commander would seem to be the most suitable person to employ for reconnoitring the new position, after the battery has been withdrawn to a position of assembly. There has been a tendency to overlook the fact that the artillery brigade commander or adjutant must reconnoitre the new position in the same way as in the case of the occupation of the original position, and will, therefore, be able to save the battery representative some trouble.

The sections dealing with ammunition supply have been amended in accordance with the new system which involves the replacement of the present horsed divisional ammunition columns by others drawn mechanically (where such transport does not exist some modification in the dispositions will be necessary).

These columns are under the orders of the inspector-general of communications, the general effect being to extend his sphere of control to within a few miles of the fighting troops. In this way it becomes possible to withdraw from the existing brigade ammunition columns nearly all the G.S. wagons carrying ammunition and to form them into divisional ammunition columns, thus increasing the mobility of the former and reducing the congestion on the roads in the immediate vicinity of an action.

Chapter 10 contains instructions for the guidance of officers and others responsible for training artillery in field engineering, reconnaissance, range finding, and intercommunication duties. As regards the first, it is essential that the Manual of Field Engineering should be read in conjunction with it; while as regards the remainder, the experiences of individual officers should be used to furnish additional sources of instruction.

The last chapter entitled "Movements and Quarters" deals with such subjects as march discipline, chiefly from the point of view of artillery marching with other troops; billets, a subject on which no regulations previously existed; and transport by land and sea.

B.—MOUNTED RIFLE TRAINING, 1912.

Mounted rifles and mounted infantry are troops trained to shoot and ride, with a view to operating in the field by rifle action, using their horses as a means of moving rapidly from one point to another. These troops are not trained for mounted shock tactics. The difference between mounted rifles and mounted infantry is that the latter have been fully trained as infantrymen before being taught to ride and employ mounted rifle tactics, whereas the former are trained as mounted riflemen only.

Though the principles on which all mounted rifles fight are identical, the methods adopted by the various branches of mounted

rifles throughout the Empire of putting these principles into practice have up to the present differed considerably.

This difference is largely due to the number of training manuals in existence. At home the yeomanry have used Cavalry Training, to which a short Appendix is added showing what parts of the Manual are applicable to them, while the mounted infantry have had a separate manual called Mounted Infantry Training, in which the drill differs considerably from that contained in Cavalry Training. Abroad Canada has made use of Cavalry Training, Cape Colony and Natal the Manual of Mounted Riflemen and the Manual of Instruction for the Mounted Forces of Natal respectively. In Australia the Light Horse Manual is in force, and in New Zealand the New Zealand Mounted Rifle Training is the basis of instruction.

With the object of securing greater uniformity of training, and incidentally of reducing the number of manuals dealing with the one subject, a manual called Mounted Rifle Training has been published. Though written primarily for the yeomanry and mounted infantry of the United Kingdom, care has been taken to make it suitable for the use of the Oversea Dominions, all of which, it is hoped, will adopt it for the use of their mounted forces.

The manual is divided into two parts. Part I (chapters 1 to 6) contains the general principles of imparting instruction, the details of drill mounted and on foot, and riding instructions for the recruit.

Chapter 1, after giving definitions of the terms mounted rifles, mounted infantry, and mounted troops as used in this Manual, describes the organization of mounted rifles, and further on gives the definitions, signals, and intervals and distances in drill which it is necessary for a mounted rifleman to know.

In chapter 2 the general principles of training are given. It is pointed out that the varying conditions under which soldiers are trained in the different parts of the Empire make strict adherence to any one method of training impossible, but that the principles on which the methods should be based are constant, and that the system described in the Manual may be taken as a general guide as far as the circumstances of each case permit.

In the next chapter drill on foot, with and without the rifle, and the dismounted drill of the machine gun section are described. Following the policy adopted in the preparation of a new Cavalry Training, now under preparation, it has been decided that the individual drill of mounted rifles should agree as far as possible with that laid down for infantry in Infantry Training.

In the chapter which deals with equitation the system of instructing the recruit is the same as that given in Cavalry Training. Although in the case of men who are good horsemen on enlistment it may be necessary to spend very little time on the preliminary stages of

instruction in equitation, it will still be necessary for every soldier to learn the military system of mounting and dismounting, leading and securing horses, and handling the rifle when mounted.

As mounted riflemen will seldom be called upon to train young horses, no instruction on this subject has been included; if required, it will be found in Cavalry Training.

The preparation of the chapter on the drill of troops, squadrons, regiments, and brigades presented some difficulties owing to the variations in the drill described in the various mounted rifle manuals. In some cases, for instance, the centre guide is not included in a section, in others he is; sometimes the serrefiles are in line with the troop, at others they are in rear; and sometimes the section consists of four men while in other cases it consists of five. In choosing a drill to suit every branch of mounted rifles, it was obvious that, whatever drill was adopted, most units would have to make some alteration in that already in use. The drill contained in the Manual just issued was adopted firstly because of its simplicity, and secondly because its adoption was likely to cause the minimum amount of inconvenience to all mounted rifles.

The formations of a troop are line, column of sections (troop column), column of half sections, and column of single files. In line the sections of four men each are side by side, and the serrefiles are half a horse-length in rear of the flank sections. The No. 4 of the right centre section is the centre guide when the troop consists of an even number of sections, and the No. 2 of the centre section when it consists of an odd number. In column of sections, half sections, or single files the troop leader marches in front of the troop and not in line with the leading section, half section, or single file, and the serrefiles ride either in front or in rear of the troop according to whether the flank on which they are posted is at the head or rear of the column. In this manner the frontage of the column never exceeds the frontage of the leading unit; for instance, in column of sections the greatest width of the column is 4 yards, and in column of half sections it is 2 yards. By this means the risk of blocking the traffic—always a point to be considered in this country of narrow, well-fenced roads—is reduced to a minimum.

The formations of a squadron are line, squadron column, squadron close column, line of troop columns, and column of sections, half sections, and single files. Squadron close column is a rendezvous formation in which the troops are one behind the other as in squadron column, but closed up as near as possible to each other. In line of troop columns the troops, each in column of sections (troop column), are in line at deploying interval. This formation is useful for moving over rough or intersected country to occupy a position, or for advancing when exposed to artillery or long range infantry fire.

In the last chapter of Part I the method of instruction in field

operations is described, and in it special stress is laid on the tactical instruction which can be given to small parties of officers without the assistance of other troops. Stress is also laid on the necessity for impressing on all ranks throughout the training the ineffectiveness in war of a passive and hesitating attitude and the great value of determined offensive action.

Part II (chapters 7 to 13) is devoted to the principles of action in war, and no mention is made of training.

In order to give mounted rifles a clear idea of what their rôle will be in war, the first chapter of Part II describes the principles of employment of all mounted troops, and shows how they are subdivided for different purposes. It points out that mounted rifles may, in various circumstances, be required to form part of any of the sub-divisions, and that normally the divisional mounted troops are provided by mounted rifles, while the mounted brigades, to which protective duties are usually allotted when they are acting in conjunction with a cavalry division, may be formed either wholly or partially of mounted rifles.

The chapter on marches describes the general principles, and gives certain rules which should be observed when carrying out a march. The importance of good march discipline is emphasized, and attention is called to the necessity when marching along fenced roads of leaving sufficient space at the side for the passage of staff officers and orderlies. It is desirable that particular attention should be paid to this chapter by mounted rifles, as it is only by strict attention to the principles laid down that they can hope both to retain their own mobility and to avoid interfering with the free movement of other troops.

The principles of "protection" and "information" are given in separate chapters (9 and 10) which amplify the chapters on the same subject in Field Service Regulations.

The tactical action of mounted rifles is described fully in chapter 11. "Mounted rifles have the power to move with rapidity and cover long distances in a comparatively short time. This enables them to combine fire and manœuvre to the best advantage. They are not trained in shock tactics. They depend on the rifle, the power of which they are enabled to develop to the utmost by their ability to seize favourable fire positions rapidly. . . . Their mobility enables them to act suddenly from any direction and to open fire from close formations more quickly than infantry can. Consequently, they are able to deal blows at the enemy's flanks and rear before he has time to meet them, or can overwhelm the heads of his columns with fire before he can deploy."

The final chapter deals with warfare in uncivilized countries, and is inserted more for the use of colonial corps than for the mounted rifles of the United Kingdom.

There are two Appendices, one giving instructions on the use

of the bayonet, a weapon now carried by some of the oversea mounted rifles, and the other instructions for carrying the sword.

It was stated above that the Manual was written primarily for the yeomanry and mounted infantry of the United Kingdom. It is hoped, however, that the Oversea Dominions will find it possible to give the book a fair trial, so that when the time for revision arrives the General Staff will be able to obtain the benefit of their suggestions for improvement. Owing to the South African War the British Empire is at present rich in men with wide experience of mounted rifle fighting ; it will be a pity if full advantage is not taken of their knowledge and experience before it is too late.

VIII.

BATTALION ORGANIZATION.

By an INFANTRY OFFICER.

THE demand for a four-company organization of our infantry battalions is no new one. When the astounding victories of the German armies in 1870 aroused military thinkers in England and set them to examine the causes of German success, proposals for big companies for the British infantry took definite shape. During the last 40 years the question has come up periodically for discussion, and has exercised the ablest military brains which we have possessed during that period. Successive Commanders-in-Chief and Army Councils have taken the best advice at their disposal on this question, and have pronounced in favour of the eight-company battalion. The Duke of Cambridge, Lord Wolseley, Lord Roberts, and Sir Evelyn Wood, have each in turn authoritatively refused to change the system which we still possess. In spite of these facts, which are presumably known to the advocates of large companies, the demand for change has steadily increased both in weight and volume. The supporters of the four-company system have put forward their arguments with such moderation and, at the same time, with such insistence—they number among them soldiers whose experience and position lend their arguments such weight—that it is necessary to examine what they have to say with great care in order to ascertain whether they have produced any new facts, such as should lead them to expect, with good reason, a reversal of former judgments.

The mere fact that some particular military organization is in existence is not in itself any valid reason for opposing change. Military organization, as all things else military, must, if it is to be efficient, be progressive. At the same time, as the advocates of change have been themselves the first to recognize, there are grave objections to altering normal formations which have stood the test of war, and have become ingrained in our Army by long association, unless very strong cause can be shown for the change. To change what has become deeply rooted in an army is always a critical matter. When old-established rules and organizations are altered, no one for a time

knows where to turn.¹ The onus of proof is, therefore, clearly on those who propose the change. Have they produced new facts? Have they proved their case? These are the questions which it is the purpose of this article to investigate.

Before attempting to answer them it is worth considering why it is that the reformers refuse to take "no" for an answer, and are increasing steadily in numbers. During the last 10 years we have developed a peace organization which approximates as closely as circumstances allow to our organization for war. We have, for our units, a progressive system of training which, in normal circumstances, culminates annually in army manœuvres exactly as have the great armies of the Continent. Like them we have two years in which to bring our infantry at home up to the required standard, for the greater part of our men enlist at the age of 18 and go abroad at 20. Here, unfortunately, the similarity of our conditions with those of foreign armies ends. Whereas the foreign infantry captain receives the whole of his recruits on a given day, and is entirely responsible for their education and training throughout their two years of service, our recruits dribble in as they please, part of their training has to be done at dépôts, and time has to be allowed for the recruit to develop his bodily strength, both by good feeding and carefully graduated physical exercises, until he is fit to stand the strain of modern military training. Further, the home battalions are annually depleted to supply the drafts for our overseas garrisons, and the effect of this is usually felt most severely just at the period which is the most important for the infantryman. Our companies are often pitifully weak during the time allotted to company training. Battalions are usually made up to strength during the periods of brigade, divisional, and army training, by the influx of recruits who have not been through the early stages of their field training. Thus progressive training of the individual becomes impossible. Company commanders are disheartened because they feel that they are asked to obtain the same result as the company officers of the Continent under conditions which are incomparably more difficult, and they are not satisfied that the difficulty of the position is always recognized. It is cold comfort to them to know that the reservists, whom they will receive on mobilization, will have had much longer training than the reservists of the Continent. This does not help them in their present troubles. The result has been to produce a general feeling of dissatisfaction among infantry officers. A number of them are in favour of the large company, because they feel that they could not be much worse off than they are, and that with change there is

¹ Captain Hereward Wake's article, entitled "Infantry Organization: Four Companies or Eight?" *THE ARMY REVIEW*, Vol. I, No. 2, p. 272, gives a summary of the changes involved.

at least some hope of improvement. If infantry officers could be assured that the state of affairs which has been outlined above has nothing to do with the question of a four or eight-company battalion, and that these evils would still exist if we adopted the large companies, it is more than probable the reformers would lose many of their supporters. One of the keenest and ablest advocates that the eight-company system has had, Lord Wolseley, pointed out again and again the dangerous condition at the end of the trooping season of our home battalions, which he likened to squeezed lemons,² but during his time the shoe did not pinch the company officer as it does to-day with our more intensive system of field training. The weakness of our companies during the early months of the year was not then advanced as an argument for the four-company system, because it was generally recognized, as indeed it has been by more than one of the reformers, that it really has nothing to do with the case.

It is proposed now to consider in some detail the arguments which the advocates of change have advanced, and in doing this it will be necessary to revert to this subject again. It has been thought well to clear the air before doing so by admitting that the conditions under which our infantry at home is trained are at present far from satisfactory. Remedies are undoubtedly required, but the difficulty is that remedies in almost every case cost money, and that money is not to be had for the asking. What is not admitted is that a change to a four-company organization is a remedy which is applicable.

THE OBJECTIONS URGED AGAINST THE EIGHT-COMPANY SYSTEM.

A distinguished officer, in the course of a lecture recently delivered by him at the Royal United Service Institution,³ summed up the objections to the eight-company system as follows :—

- (1) Once launched in an attack, a battalion loses cohesion owing to the excessive number of its companies and sections.
- (2) The companies, being too numerous, fail to combine their fire tactics or to generate intensity of fire at critical moments.
- (3) In a company no proper chain of command is established.
- (4) Young officers do not command men, as they should ; they are merely assistants and onlookers.
- (5) Understudies are not provided to fill the places of unit commanders who are withdrawn for various reasons ; or, if they are provided, it is done at the expense of other units.

² As a result of Lord Wolseley's representations the peace establishment of our home battalions was raised.

³ "Battalion Organization," by Brigadier-General F. I. Maxse, C.V.O., C.B., D.S.O., on 19th December, 1911.

This lecture and two articles⁴ on the same subject, which appeared last October, may fairly be said to cover the whole range of the controversy.

DIRECTION AND CONTROL IN BATTLE.

(1) *The Battalion as a Whole.*

The first objection to the present system is that the direction and control of eight companies and a machine gun section on the field of battle is more than one man can reasonably undertake.

The answer to this question is bound up with that of the number of mounted officers in a battalion. After the South African War the whole of our military organization was thoroughly investigated, and, naturally, the organization of our infantry battalions was examined as well as that of other parts of the military machine. The general consensus of opinion was that the eight-company system had justified itself in the war, but that more mounted officers were required in our battalions. As a consequence, provision was made in War Establishments for mounting the two senior company commanders if required.⁵ This need for additional mounted officers is very generally felt, even at peace training, at the present time, and is probably one of the considerations which influence infantry officers in deciding between the two systems. It would, certainly, be an advantage if the extra horses could be made available in peace, for battalion commanders would then be in a position to experiment as to the best methods of employing their mounted officers. Doubtless this will be done when money becomes available. It is not to be supposed that these additional mounted officers were authorized merely in order to take two elderly company commanders off their feet. There are two main divisions of an infantry battalion in attack—the firing line, and the battalion reserve. With four mounted officers⁶ at his disposal for purposes of command, the battalion commander can leave one in charge of the battalion and ride forward with the remainder to receive orders and to reconnoitre. He is then in a position to issue his orders for the firing line to one, for the reserve to another, and for the machine gun section to the third. He is therefore at no disadvantage compared with the commander of four big companies as to the number of individuals with whom he has to

⁴ (1) "Infantry Organization : Four Companies or Eight?" THE ARMY REVIEW, Vol. I, No. 2. (2) "The Organization of a Battalion in War and Peace." JOURNAL R.U.S.I., Vol. IV, No. 404. The writer of the latter article is not an advocate of the four-company system, but his examination of the principal factors affecting the proper working of our present system is a valuable contribution to the discussion.

⁵ See War Establishments, 1912, p. 134, note (h).

⁶ These include the commander of the machine gun section, who is mounted in war.

deal, and he has this great advantage, that his battalion of eight companies is much the more flexible, and allows him to make a greater number of permutations and combinations, in the respective strengths of his firing line and of his reserve, so that he is in a better position to adapt his formations to varying conditions.

It may be objected that such an arrangement, which is only one of many which are possible, would take a company commander from his company at the very time when he was most wanted. But if the mounted company commander be employed to command the reserve, this difficulty should not arise, for there comes a time in every attack when the battalion commander can exercise no further direct influence, except through his reserve. When this time arrives, the battalion commander will naturally assume personal command of his reserve, and the mounted company commander will return to his company, which will not till then have been required to do anything which a subaltern could not carry out.

The above is obviously only an indication of the way in which the mounted officers, authorized by War Establishments, can be used. The object, here, is not to discuss tactical problems, but to show that the distressing picture which the reformers have drawn of the poor battalion commander troubled, like the old lady in the shoe, with a superfluity of children, has not been sketched from life. Even under peace conditions at present, the senior major is almost invariably given a command of more than two companies.

(2) *The Companies forming the Firing Line and its Supports.*

In the lecture already referred to the lecturer based part of his objection to the eight-company system on the assumption that a "half-company" is not a tactical unit.

It is not easy to discover the grounds for this assumption in view of the principles enunciated in Sections 7, 8 (2), 93 (1), and 123 (1) of *Infantry Training*, 1911.

He went on to observe that the "half-company" seemed to have been invented only to give a nominal command to a subaltern.

This aspect of the controversy will be examined presently. For the moment it is sufficient to point out that even if the four-company system be adopted, the original "half-company" will still exist unchanged in all but name. It will reappear as the "section" of approximately 50 non-commissioned officers and men, commanded by a subaltern, and as a tactical unit it will differ not at all from the "half-company" of to-day.

The lecturer enlarged on the difficulties of the second-in-command in endeavouring to control four companies in the firing line during an attack. This unhappy major has no horse and no staff, hence his inability to communicate with more than one, or at most two, of these companies. By way of contrast he depicted the senior

major directing two large companies, each commanded by other majors, and co-ordinating their advance "from fire position to fire position, under the enemy's bullets." It probably will be always easier to communicate with two subordinates than with four, but the senior major, and the company majors, will still be liable to be deprived of the use of their horses at such moments, and for intercommunication they will still be dependent on signals or messengers.

On the other hand, with two large companies in the firing line, each company commander will have four section commanders to control. Will he not then be very much in the position of the senior major with the four captains? And will his plight not be rather worse, because his four section commanders will be relatively more "in the thick of it" than would be the four captains?

From the point of view of tactical requirements the question resolves itself into this: Is it easier for one man to exercise control by means of four company commanders, each of whom commands 100 men and has, in his turn, to control two subalterns; or to do so by means of two company commanders, each of whom commands 200 men and has four subalterns?

This question may be put in other words as follows: Under which system can the officers exercise the most direct influence upon their men, so as to carry out the orders and intentions of their superiors in the stress of battle?

This is really the root of the whole controversy.

The reformers have tacitly assumed that the big companies have emerged triumphantly from the test of war. Putting Manchuria aside, for it cannot be considered that we have yet obtained sufficiently detailed information as to the Russo-Japanese War to enable us to form a considered judgment on a technical detail of this nature, let us turn to 1870. Now undoubtedly, as has been stated above, one of the first lessons drawn from that war was that the four-company battalion had proved its worth. It was admitted that the Prussians had not adopted this organization solely, or even chiefly, on tactical grounds, but it was held that its success on the battlefield could not be disputed. The German official history drew a discreet veil over the happenings in rear of the infantry firing lines in the great battles of the war. It was not until some 10 years later, when Meckel (the instructor of the modern Japanese army) and Hoenig began a series of historical and tactical discussions, and disclosed many facts which had not been appreciated outside a somewhat narrow circle in Germany, that the veil was lifted, and that scenes of disorder and confusion behind the front lines were revealed which shook the confidence of the supporters of the big companies. For some 20 years the problems of how to organize the disorder of the battlefield, how to increase the control of the infantry officer over his men, when they

were extended in battle, were the most frequent subjects of discussion in German military literature.⁷

When the details of the great battles of 1870 were better known, it became obvious that the four-company organization had not proved altogether so successful as had been thought, and many, who had at first advocated a four-company system for our Army, began to consider that, after all, our eight companies gave us advantages which it would be most unwise to forego. Now, while we are considering this point, it is worth while pointing out that in addition to giving the Continental company commander the whole of his annual quota of recruits on one day, compulsory service provides him with a number of highly-educated men in the ranks. A field is therefore opened for the selection of non-commissioned officers of an intellectual standard, to which we cannot hope to attain. Clearly, therefore, the need for the direct influence of the officer is greater with us.⁸

In this matter of the control of officers our organization stood the test of the South African War. The test was, of course, not so severe as that of the big companies in 1870, but still it was serious enough to bring to light any organic defects had they existed. Should we be wise to change a system which has proved successful under certain conditions for one which has at best proved a qualified success in the one great war as to which we have fairly complete details before us?

It was mainly because both their own experience of war and their study of military history led them to believe that the small company gave the company leaders the best chance of getting their men into a position, whence they could charge home with the bayonet, that the great authorities, who, in the past, have had to review this question, have repeatedly pronounced in favour of the eight-company organization. It cannot be said that the reformers have produced any fresh evidence on this vital point. Their arguments are based upon their personal convictions, which, however honest they may be, must be ruled out of court unless they are supported by evidence from the battlefield.⁹

⁷ One of the most interesting and readable, and, at the same time, the most easily accessible to English readers of these is a pamphlet called "A Summer Night's Dream," generally ascribed to Meckel. Part II of this contains the author's experiences as a company-commander in the battlefields of 1870. It has been republished in America in book form, under the following title:—"A Summer Night's Dream. Translated from the German by Captain G. (Reprinted from the *United Service Magazine*.) Kansas City, 1908."

⁸ Home's "Précis of Modern Tactics," 1st Edition, 1873, pp. 98-100, contains an interesting discussion on this point.

⁹ In this connection it is interesting to quote a remark made in the February number of the *Revue Militaire des Armées Etrangères*. The second article in that number is a review of Infantry Training, 1911. After describing our instructions for fire direction and control, the author says:—"Peut-être n'est-il pas inutile d'observer que la compagnie anglaise dépasse à peine

COMMAND, TRAINING, AND ADMINISTRATION.

The complaints against our present system under this heading are briefly as follows :—

- (i) In a company no proper chain of command is established.
- (ii) Young officers do not command men as they should, but are merely assistants and onlookers.
- (iii) Understudies to fill the place of unit commanders are only provided at the expense of other units.

These are definite statements, and, unfortunately, there are good grounds for belief that they are substantially true in the case of some, though by no means all, of our battalions serving at home. That they are true of more than a very few of the battalions serving abroad the writer is loth to believe.

Perhaps the simplest method of discovering whether this unsatisfactory state of affairs is really due to the eight-company system is to compare the status of the junior officers in a battalion under that system with their status in a battalion organized in four companies. In making this comparison, a battalion serving at home under peace conditions will be taken as the basis, for it is in peace that the true foundations of any system of command must be laid. Moreover, in working on a peace establishment, there are administrative difficulties to contend with which are not encountered in a battalion at war strength.

THE STRENGTH OF A SUBALTERN'S COMMAND IN PEACE.

The peace establishment of privates in a home battalion is 680. If a deduction is made for boys, recruits at dépôt, bandsmen, signallers, and other specialists, the actual balance remaining for distribution among the companies will rarely amount to more than 520 during the training season. Accepting the fact that under our system of voluntary enlistment it is not practicable to increase this establishment materially, the maximum number of privates who can be regarded as the property of the company will not exceed 65 in the case of an eight-company battalion, and 130 under the four-company system. During the winter the numbers will be reduced considerably below these totals.

In the one case, therefore, there will be for each subaltern a "half-company" of some 35 non-commissioned officers and men, and in the other a "section" of precisely similar strength. If it is not possible to give a young officer "command of men" in the former case, how is it any more practicable in the latter?

The case is the same as regards the non-commissioned officers in command of the smaller units within the company. Joining up two

100 hommes. La tâche du capitaine y est donc relativement facile. Celle du commandant d'une compagnie de 250 hommes est, au contraire, extrêmement lourde dans les conditions de la guerre moderne." *The Revue Militaire des Armées Étrangères* is edited by the French General Staff.

of the present companies into one will not of itself renew the chain of command which some commanding officers apparently have allowed to become rusty through disuse. The only cure is a return to that delegation of authority and responsibility which was the keynote of Sir John Moore's teaching. Nothing is more at variance with the spirit of that teaching than the practice of transferring a subaltern from one company to command another in the temporary absence of its captain, over the head of a subaltern rightly belonging to the latter company. The essence of any system of command is that the next senior in every unit, be it company, half-company, section, or squad, shall assume command in the absence of his immediate superior.

THE ADMINISTRATIVE RESPONSIBILITY OF THE INFANTRY SUBALTERN.

So far as the strength of his command is concerned, the subaltern will be no better off in a battalion of four companies than in one of eight. As regards general responsibility he may be worse off under the four-company system, for it is a feature of that system that the entire administration of the company is to be in the hands of the captain, who would otherwise have nothing to do at all. But every detail administered by the captain is something taken from the subalterns. How can the spirit of the principles enunciated in Sections 82 and 93 of *Infantry Training, 1911*, be observed if the responsibility of the subaltern to the company commander for all that affects the well-being of his men in barracks or in the field is not to be absolute?

COMPARISON WITH THE CAVALRY AND ARTILLERY.

The advocates of the four-company system are never tired of comparing the status of the subaltern of cavalry or artillery with that of the infantryman to the disadvantage of the latter.

In this connection it is to be noted that cavalry and artillery subalterns do not command many more men in peace or in war than do subalterns of infantry.¹⁰ Officers of the mounted arms have both men *and horses* to care for at all times. It is the inclusion of the horse that gives them a double interest and opportunities for experiment which the infantryman can never hope for. Merely to double the strength of a company will not alter the original factors of the problem. Seeing, then, that he has but one factor, the man, to deal with, would it not be fatal to relieve the infantry subaltern of responsibility for the smallest item in the administration of his command, be it designated "half-company" or "section?" It is in the daily

¹⁰ The combatant strength of a subaltern's command in war in the cavalry, field artillery, and infantry respectively is as follows:—Troop—34 non-commissioned officers and men. Section—56 non-commissioned officers and men. Half-company—54 non-commissioned officers and men.

round and common task that the true spirit of discipline and of mutual respect between officer and man is bred and nurtured.

The real solution is to give a subaltern command of his half-company from the day he joins, and to impress on him that its interests and his are one; not only on parade, but in the barrack-room and on the cricket and football fields as well.

THE CAPTAINS AND COMPANY MAJORS.

What then is the fate of the captain? Even if he is to be made responsible for duties which should be performed by the subalterns, where is his real responsibility and authority? Surely if anyone is to be an "assistant and onlooker" it will be he.

From the point of view of the company major the proposal no doubt has some attractions. He, at any rate, will have some slight access of importance, and in peace can look forward to a company of perhaps 140 non-commissioned officers and men to train in place of one half its size. It must not be forgotten, however, that the proportion between the training strength of the company and its war strength will remain precisely the same as under our present system, and that the peace company of 140 men will no more represent a large company at war strength than the 70 men to-day represent the small company at war strength. In any case it cannot be denied that any advantage that the four majors will gain, in respect of a larger command, will be at the expense of the four captains who would otherwise be commanding companies of their own. Taking the general average of the infantry at the present time, it may be said that an officer obtains permanent command of a company at 10 years' service. With a four-company system, permanent command would not be obtained until 20 years' service. Of course, officers would often be in temporary command at an earlier period of service, but this applies with even more force to the present system under which there are eight opportunities for subalterns to gain experience in charge of companies. Nor is it easy to see how the four-company system is to force the battalion commander, who wishes to centralize authority, to delegate power and responsibility. Our experience, both in peace and war, shows that young infantry captains are as worthy of responsibility as the more senior. If commanding officers refuse to decentralize in the one case, what guarantee have we that they will do so in the other? Where then is the ultimate gain in the direction of increased command and responsibility at an earlier age?

CONCLUSION.

The result of this examination of the advantages claimed for the four-company system over the eight-company system may be summarized as follows:—

- (i) From the point of view of tactical requirements the four-company system has no advantage over the present system ; on the whole, the balance seems to be in favour of the latter.
- (ii) From the point of view of command, training, and administration, the defects complained of in the eight-company system are not inherent in that system ; where they exist they are due either to the difficulties caused by voluntary service and by the maintenance of overseas garrisons, or to neglect of the true principles of delegation of authority and responsibility.

It is probable that this tendency to over-centralization is aggravated by the conditions under which our Army is raised and maintained, but these conditions will not be altered by re-organizing our battalions in four companies instead of eight, nor by reducing the number of companies in a battalion from eight to six.

The latter alternative, although it has some attractions from the point of view of training and administration, would almost certainly lead to the reduction of the number of captains in every battalion, even if there should be a corresponding increase in the number of subalterns.

The real difficulty in administering the company system in its entirety, whether there be eight companies or four in the battalion, lies in the necessity for posting recruits to the battalions from the depôts before they have completed the prescribed course of recruit training.

To remove this difficulty completely it is essential not only to increase the barrack accommodation at our depôts, as is now being done, but to provide sufficient rifle ranges within reasonable access of them, so that no recruit shall be posted to his battalion until he is fit to take his place in the ranks as a trained soldier in every respect. This is no doubt a counsel of perfection, but there is no use shutting our eyes to the fact that therein lies the solution of the company officers' problem so far as training is concerned.

Another unsatisfactory feature is the discrepancy between the peace and war establishments of officers and non-commissioned officers in battalions of the Expeditionary Force.

The financial objections to an increase in the peace establishment are easily understood, but they are not insuperable. Is it too much to hope that if some compensating reduction can be made in other directions, for example, a decrease in the number of soldiers employed in making music, the ruling authorities will lend a sympathetic ear to the demand for a few more officers and non-commissioned officers ?

If this demand be granted, and if the facilities for training at the depôts of the Infantry of the Line be increased so that the system in vogue at the Guards' Depôt can be adopted universally, it is believed that the great majority, at least, of infantry officers who examine

the problem fully would be definitely in favour of retaining an eight-company organization.

Whether this belief be justified or not, it would seem wise, at any rate, that a close examination should be made of the possibilities of remedying the defects of a system which has stood the test of war, and has been approved by our ablest and most experienced soldiers, in the past, before we embark on a sweeping change of organization. Such a change is a very serious matter. It would undoubtedly affect, for a time, our readiness for war, and, in these days, the importance of constant readiness for war outweighs many other considerations. The full effect of the change on mobilization arrangements, on training for war, and on other vital matters, cannot be fully considered in this short paper; but it is clear that it is a serious factor in the problem.

IX.

STAFF WORK WITH A DIVISION ON THE MARCH.

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THERE are many subjects which are necessarily only described in principle in the Training Manuals and Regulations, but which, to be dealt with efficiently on active service, require a great deal of practice, consideration, and forethought in detail.

Prominent among these is the subject of staff work in connection with the handling of a division in the field, marching, billeting, deployment, &c. A staff officer may be well acquainted with the principles laid down in the Manuals and Regulations, but, at the same time, be incapable of carrying them out in the field owing to an improper or neglected study of the practical side, and to a failure in grasping the many points of detail involved.

In staff tours and other mental exercises there is a natural tendency to scamp the consideration of problems of staff work involving detail, because such problems are uninteresting, and the time, which is limited, is devoted almost exclusively to the more absorbing field of strategy and tactics.

In manoeuvre training, financial and other restrictions prevent the elaboration of theories and the performance of staff duties as they would have to be carried out in war.

The natural consequence is that sufficient attention is not always paid to this important subject. Problems, which might naturally confront a divisional staff in connection with the march, the billeting in depth, the resumption of the march from depth, the deployment from column of route, the crossing of columns, the change of direction, &c., would, in many cases, be left to an unready and haphazard solution at the last moment.

It is unreasonable to expect success in either strategy or tactics, unless the divisions of the Expeditionary Force can be brought on to the battlefield in good condition, unfatigued, well fed, and full of confidence in themselves, their leaders, and their staff.

In considering this subject it is well to take three axioms as a foundation :

(1) "*The easiest operation in peace becomes difficult in war.*"—It cannot be held that the collective training season from divisional to army manœuvres provides altogether adequate training for war in respect of staff details. Divisions manœuvre in skeleton at about one-quarter of their war strength, as a rule ; they camp or bivouac in mass, march usually on two or more roads, and deploy from an already extended front. It may reasonably be assumed that the staff obtains little real or practical experience in making such arrangements as would be of everyday occurrence in war.

How much more difficult then would be the handling of a mobilized division in peace, and would not these difficulties be still further accentuated in war ?

It is submitted, therefore, that it is of the first importance in all theoretical exercises to give due consideration to staff details, and to provide an accurate and simple solution to all problems which may arise. It is further incumbent on staff officers to give their continued and systematic attention to the subject.

(2) "*Troops must not be unnecessarily fatigued.*"—Unnecessary delay in the issue of orders and instructions is an inevitable and frequent source of fatigue and discontent both on the march and in the occupation of quarters. Troops must leave their billets at the last possible moment, and "hanging about" must be reduced to a minimum.

(3) "*Troops must have confidence in the staff.*"

The object of this paper is to discuss very generally and briefly a few points in connection with this class of staff work, not with the intention of working out any specific problem to a logical conclusion, but rather with the object of drawing attention to an important subject.

The division is taken as the unit for purposes of discussion, because it is the important unit. If the division is well-administered by an efficient staff, is handy and flexible, then affairs generally will tend to proceed smoothly, and the tasks of the higher (army) and lower (brigade) staffs will be greatly facilitated.

The division at war strength in column of route on one road (it is improbable that more than one road will be available in war) occupies approximately $9\frac{1}{2}$ miles, exclusive of advanced guard, train, and divisional ammunition column.

The first necessity is to realize the proportions of a division at war strength, and this is no easy task. It was remarkable that during the Army Manœuvres in 1910, when the 2nd Division was completed to war strength, misconceptions arose owing to batteries being mistaken for brigades, and half-battalions for battalions. Mobilized units

become at once unwieldy to a staff accustomed in peace to the handling of skeleton units. It must be remembered that the main body of a mobilized division will take nearly four hours to pass a point, and that at least three halts will have taken place before that point is cleared. A peace division will clear a point between two halts.

It will be necessary, before embarking upon any discussion of details and arrangements in connection with the marching of a division, to define the circumstances under which such a march is conducted.

The hypothesis, so far as this paper is concerned, is that a division is marching on one road with other divisions marching parallel on either flank; that the march constitutes a forward movement from the area of concentration, or a forward movement from the point of detrainment or disembarkation within the theatre of operations. Such a march might conceivably be of two, three, or more days' duration before close contact with the enemy is obtained, or the forces deployed for battle.

It is obvious that, under such conditions, during the earlier stages of the march, the comfort of the troops must be studied, and that in the later stages tactical considerations will gradually become of paramount importance.

In the case in which the Expeditionary Force is executing such a march, no doubt the front will be covered by the protective mounted troops which will, in the earlier stages, be well advanced, and in the later stages, will be gradually driven back on and to the flanks of the army.

The question will therefore arise as to how the comfort of the troops can best be catered for during these earlier stages, say the first two days' marches, and what changes will be necessary later, and how will they be effected in order to conform to tactical requirements.

When marching from day to day and billeting in depth, will it be advisable to change the order of march and advanced guard from day to day to suit the comfort of the troops? There is no doubt that such changes are quite feasible; they require time and very careful prearrangement by an efficient staff thoroughly accustomed to such work. It must, however, be admitted that these changes will present considerable difficulties, and it is doubtful whether they will be arranged quickly and carried out so efficiently as not to involve considerable hardships on the troops.

Paragraphs 23, 27, and 66 Field Service Regulations, Part I, give a free hand as regards the advanced guard and order of march, subject always to the rule that, when contact may be expected, tactical considerations override others, and that when at some distance from the enemy, the comfort of the troops must be considered first.

It is no easy matter to change the composition of the advanced

guard, or the order of march of the main body, when a division is executing such a march as that under consideration and billeting in depth. If such a change be made, then, at least to the unpractised hand, the staff and administrative arrangements will become so complicated, that more distress will probably be caused to the troops than will result from having the same advanced guard, and, so far as is possible, the same order of march of the main body.

While recognizing that it is out of place to dogmatize on such a subject, it is, however, suggested that the permanent advanced guard and the fixed order of march will remove many difficulties and offer the simplest solution.

If tactical considerations permit, and the troops are to be spared and their comfort considered, a great deal can be done :

Firstly, by marching "open"—i.e., making no attempt to obtain continuity on the road.

Secondly, by completing the arrangements for billeting well in advance. This can naturally be carried out if the enemy is at some distance. †

There would appear to be every inducement to have a permanent advanced guard :

- (1) The march is resumed with ease.
- (2) No reference is necessary in operation orders. An itinerary or march table can be issued.
- (3) There is greater facility in administering the train.
- (4) The commander becomes acquainted with his command.
- (5) The service of protection is more efficiently performed.
- (6) The difficulties involved by taking a new advanced guard from the main body and relegating the old advanced guard to the main body are not experienced.
- (7) The start need not be so early.
- (8) Outposts are thrown out and withdrawn more easily.

It might, on the other hand, be argued that the duties are too onerous to be made permanent, but this need not be the case if the advanced guard is, from the outset, sufficiently strong. In addition, there are compensating advantages, *e.g.*, the marching is easier, the roads are good, free from dust and not cut up, and the billeting area is not so restricted. It is suggested, therefore, that this permanency is a matter of necessity rather than of choice (Von Schellendorf "Duties of the General Staff," page 359).

A free hand is again given in Field Service Regulations, Part I, paragraph 66, as regards the composition of the advanced guard, which should consist of all arms.

The strength of the advanced guard depends on the tactical situation and on the duties allotted to it by the divisional commander. It must be able to offer sufficient resistance to enable the

main body to deploy. There is much to be said in favour of a strong advanced guard (Von Schellendorf "Duties of the General Staff," page 360). The chief objection is, that if too strong, too much power of action is conveyed to its commander, but this objection appears to be more imaginary than real.

It should be commanded by a brigadier-general of infantry and consist of :

- (a) All the available mounted troops.
- (b) Field Artillery, but not so much of it as would render the advanced guard unwieldy. More than one battery is difficult to handle, and occupies too great a length of roadway, unless there are exceptional circumstances which demand more guns.
- (c) One Field Company R.E., unless there are circumstances which make it desirable to split the company. The pontoon and trestle wagons might not be required, in which case it would be better not to include them, and eliminate every possible vehicle not required.
- (d) Two or three battalions of infantry—the German system of three is suggested. Three form a good number for duties and for field operations. They do not make the advanced guard too unwieldy. The brigadier has the bulk of his brigade under his command. The remaining battalion forms a separate unit of command.

It may be argued that it is objectionable to split up the brigade by relegating one battalion to the main body. Some infantry is, however, necessary at the head of the main body to protect and act as escort to the artillery, and it is undesirable to place a whole brigade of infantry so far forward. The fourth battalion of the advanced guard brigade would seem to provide sufficient protection for the artillery, and could be sent forward without difficulty to rejoin its brigade when such a course appeared to be desirable.

The composition of the permanent advanced guard suggested for the march under consideration in this paper is shown in Appendix A, page 415.

As regards the order of march of the main body, there are certain guiding principles contained in Field Service Regulations, Part I, paragraph 27. Briefly, they are as follows :—

- (a) Troops should march in the order in which they will be required to come into action.
- (b) Field engineers and some infantry are required at the head of the main body.
- (c) Then follows that portion of the artillery which would probably be required in the early stages for the development of the action. Whether the bulk of the artillery is required or not

depends largely on the nature of the country, and what views the commander may hold on the employment of quick-firing artillery.

- (d) Then follow the remainder of the infantry and artillery.
- (e) Brigade ammunition columns and field ambulances march in rear followed by the train.

A suggested order of march for the main body of a division is shown in Appendix A.

It would appear to be a very difficult task for a divisional staff to control on the march all the separate units of a division, to put them into billets, to take them out of billets and resume the march from depth, to arrange the halts, and to see to the innumerable details which make for comfort and efficiency on the march and in quarters. The divisional staff at such a time will be fully occupied with other important matters, and it is necessary to simplify the march as much as possible so far as they are concerned. The division is grouped into brigade areas when in billets, and there appears to be no reason why this principle should not be extended to the actual march itself. If the division is grouped for purposes of marching and billeting, then the task of the staff is rendered comparatively easy, as will be shown later. Moreover, this system would greatly facilitate control, billeting arrangements, arrangements for the resumption of the march, the distribution of orders, &c.

There is nothing in this proposal which contravenes the Regulations, nor is there any intention that the grouping should apply to any operations other than marching and billeting.

The proposed grouping of a division on the march is shown in Appendix A.

An effort has now been made to make out a case for the permanent advanced guard, for retaining the same order of march of the main body, and for the system of grouping on the march and in quarters for purposes of control. A further effort will be made to show the advantageous effect of these proposals when put into practice.

It will now be necessary to take the concrete case of a division marching from day to day and billeting in depth.

Let it be imagined that the 2nd Division has disembarked at Portsmouth and is marching from the South Downs to the Thames about Reading (*see Map, Appendix B*); that, on the completion of the day's march, the head of the main body has reached Alton; that the main body is stretched out along the Alton-Selborne-Liss-Petersfield road in billets in villages and farms on the road and off the road a mile or two on either side; and that the advanced guard is somewhere about the line Upton Grey-Long Sutton.

It will be well to ask a few simple questions, the A.B.C. of staff work, in connection with to-morrow's march.

Questions.—(1) Where is the starting point for to-morrow's march, and what orders will be issued for the resumption of the march?

(2) A field ambulance is billeted at East Liss, three hours back on the road. There will be three halts before it reaches the starting point if that point is at the head of the main body. Is it proposed that the administrative medical officer should make his own calculations as to when he is to vacate his billets?

(3) A field artillery brigade is billeted at Newton Valence on account of the accommodation for horses. Newton Valence is two miles off the road. There is a farm track, not shown on the map, running from Newton Valence to Norton Farm. Will it be necessary to lay down the route for the brigade from its billets to the main road? And if not, what extra allowance of time must be made for this brigade to reach the starting point?

(4) If halts are signalled back from the head of the main body, then the tail will never halt. What is the best arrangement to secure a 10-minutes' halt for everybody every hour?

(5) Where units are billeted off the main road, will it be necessary to have staff officers at the side roads to see that the correct order is maintained?

(6) If a new advanced guard is to be formed and the old advanced guard relegated to the main body, what special arrangements will be necessary? Orders were on one occasion in 1910 issued for an advanced guard, consisting of (at war strength) a section Field Company Royal Engineers, a battery Royal Field Artillery, a battalion, a section Field Ambulance, to assemble at a certain point at a certain time. It took the commander half-an-hour to get them sorted out and ready to march after arrival.

(7) What arrangements are being made about the allotment of billets for to-morrow night if it is settled that the head of the main body is to reach Mattingley?

(8) What arrangements are in existence to prevent the wearisome halting and hanging about which is generally the preliminary to occupying quarters?

(9) Will it be possible to say during to-morrow's march what particular point on the road at any given time a certain unit has reached?

(10) If a cavalry brigade is ordered to cross the line of march of the division at a certain hour, and it is considered desirable that it should cross between the fighting troops and the brigade ammunition columns, can this be arranged at a moment's notice, and so timed that no unit is kept waiting?

(11) If a hurried deployment is necessary, can it be said at once,

and without hesitation, which side roads and tracks can best be used by the various units of the division?

(12) What form will the divisional operation orders take? Will they be simple, concise, and only consist of a few lines at most?

The above are a few of the simplest questions which can be asked.

If the divisional staff have not got satisfactory answers ready at a moment's notice, then it is reasonable to suggest that the troops will be unnecessarily fatigued, that they will not have confidence, that there will be delays, orders, counter-orders, and disorders, and that the division will not be brought forward in the best condition.

The serious business of fighting will commence under disadvantageous circumstances which might easily have been rectified by forethought and study in peace.

It is proposed to deal with a few of these points and offer suggestions and simple solutions. The solutions may and will doubtless be rejected as unworkable, but solutions there must be, and they must be worked out at war strength to the very last detail.

It may be said, and rightly so, that conditions vary to such an extent that it is impossible to have any fixed arrangements for war.

That is undoubtedly the case, but it is also obvious that the more problems that are worked out, the easier will it be to solve the remainder, and that facility will come with practice.

It is assumed that the 2nd Division is billeted in depth from Alton to Petersfield, and that there is a permanent advanced guard on the line indicated above.

It is proposed to divide the division into a permanent advanced guard, four groups or brigade areas, and the train. The latter will not be considered in this paper.

Group 1 is essentially an artillery group with its escort of infantry for protective purposes. It should be commanded by the General Officer Commanding Royal Artillery for purposes of marching and billeting, and is ready under his hand for deployment. Consisting chiefly of mounted troops, the range of billeting of this group is naturally wider than that of those groups consisting chiefly of infantry. It forms No. 1 Brigade area in billets.

Groups 2, 3, and 4 require little explanation. They each constitute brigade areas in billets. *Group 2* consists of formations which might very well be used together for purposes of co-operation in battle. *Groups 2 and 3* are commanded by infantry brigadiers.

The above grouping is shown in Appendix A.

The depth of the division in billets, under the hypothetical conditions accepted, should not normally exceed its length in column of route, but this must be elastic according to the accommodation available and the degree of readiness for action required.

In such marches as those under consideration there can be no definite line drawn between open and close billets. Open billets will naturally be resorted to when possible, but at times, and more often than not, a combined system will have to be used. It must always be remembered that the worst billet is better than the best bivouac, and that accommodation must be fully utilized.

Group 4 appears to be badly arranged so far as billeting is concerned, as it consists chiefly of horses with a small percentage of men. This, however, can be allowed for by the divisional staff in making the allotment. It can, moreover, remain scattered for quartering almost up to the time that contact is obtained.

When at a distance from the enemy, and when the division is covered at some distance by the protective mounted troops, the divisional staff, together with the billeting parties, can presumably march the previous day to the next day's billets and make careful arrangements for the quartering of the troops.

There will, however, come a time when no such arrangements can, from one cause or another, be made. Either the direction of the march may be altered, or the enemy's mounted troops may prevent arrangements being made on the previous day. In such circumstances, the divisional staff will not have sufficient time to proceed by motor or by any other means and reconnoitre an area with a view to dividing it up and allotting billets to the division.

Notwithstanding the fact that close contact may be expected the following day, the division will continue to billet in depth, and will neither be closed up nor bivouac.

Whatever arrangements are made will, in this case, have to be made roughly and quickly, probably while the day's march is actually taking place. As soon as the destination is known, the divisional staff will, after a study of the map, together with any data available, roughly allot areas¹ according to the accommodation apparent from the map and data, taking into consideration also any tactical requirements.

The brigade areas must be allotted and notified as early as possible to the area commanders, so that the representatives of the latter may have the maximum time to inspect their areas and assign billets to the respective units.

Each group or brigade area commander will send forward at the earliest possible moment an officer who is an adept in billeting, and who has been thoroughly trained in peace to allot billets rapidly and assess accommodation by eye. This officer must not be a brigade-major who is otherwise occupied, but he must be a specially selected officer who is a billet-master for the brigade area or group. He

¹ The areas are roughly marked on the Map, Appendix B, and Graphic, Appendix C.

would proceed as early as possible to inspect his area, see the local authorities—if there be any present in such circumstances—allot billets for the units of his group, and make a rough plan showing the allotment. He would also have sent word to the regimental billeting parties where to meet him.

The regimental billeting parties, consisting of the quartermasters and a few non-commissioned officers, pioneers, and sanitary men on bicycles, would assemble by groups either with the advanced guard or immediately in rear of it. These parties must arrange to march so as to clear the head of the main body before the hour of start. They will march direct to the rendezvous arranged by their billet-masters, take over the billets allotted to their units, make all ready for their reception, and make the necessary arrangements for meeting and guiding them without delay by the most direct route to their quarters.

Unless other divisions are marching parallel on either flank, it does not seem to be worth while limiting the lateral distance to which troops may go to find accommodation. It must be remembered by all that mounted troops can go fairly wide without undue fatigue, but that infantry cannot do so. If, however, other divisions are marching on parallel roads, say within six miles on either flank, then it will be necessary for the army staff to define the limits on either flank for purposes of quartering.

It is not proposed to go further into this question of billeting, which forms a study in itself and demands considerable attention to detail. The practice of imaginary billeting combined with the winter route marches when troops stand shivering in the cold outside houses, and brigade-majors and adjutants gallop about performing work which others would do in war, does not appeal to the senses as instructive training in the art of quartering troops. Selected billet-masters and regimental billeting parties must be frequently practised in schemes on the ground in order that their duties may become familiar.

As regards the forward march for the second day, it will be necessary to resume the march so that the whole division will be contiguous on the road. Delay and unnecessary fatigue must be avoided, and no unit should leave its quarters earlier than is absolutely necessary.

There appear to be three ways of carrying this out :

- (1) To give one starting-point in Alton at the head of the main body, and to give each unit a time at which to pass that point. This would involve, say, a field ambulance having to calculate with accuracy the time it would take to march from Liss, nine miles to the starting-point; it would have to calculate the number of halts which would take place before

it reached that point and allow for them, and it would probably be cut out by some unit appearing down a side track. Such a system might, in theory, appear to be satisfactory, but in practice it is inconceivable to imagine that there would be no delays, no confusion, and that any degree of contiguity on the road would be obtained.

- (2) To give several starting-points on the main road, to allot certain units to certain starting-points, and to give each unit in the division a time at which it should pass its own starting-point. This will involve a great deal of labour for the divisional staff. The billets of some units may, in the meanwhile, have been re-adjusted, and the starting-point allotted be no longer suitable. The system is intricate, and it will be difficult to control the arrival of units at their starting-points. Errors are liable to creep in and cause delay and friction.
- (3) To allot starting-points to each brigade area, and to give times for the head of the troops included in the areas to pass their starting-points. The brigade area commander's staff officer will in this case work out the time each unit in his area should pass his own area starting-point.

This latter system is the one advocated. It involves no trouble to either the divisional or brigade area staff. It is simple and accurate. If any inaccuracies do occur, the brigade area commander, who has issued the orders, is ready on the spot to make any necessary adjustment.

So far as the work of the divisional staff is concerned, all that is necessary is to select certain starting-points at the head of each brigade area and allot times, so that all the groups (*i.e.*, the troops included in the brigade area) become contiguous when the march is resumed. This is the work of a few minutes by means of the Graphic, which is a mechanical calculation, and is explained for the benefit of those who may not be acquainted with it. (*See Graphic, Appendix C.*)

The Graphic is a table showing time and space calculation, and is recommended for the simplification of staff work (Field Service Regulations, Part I, paragraph 25, sub-paragraph 5; also Von Schellendorf "Duties of the General Staff," page 344). The time is shown along the top from left to right, the distance to scale half inch to one mile along the left from top to bottom. Both the time and distance are generally arranged to scale so that one hour along the top is equal to three miles down the side. This is the normal rate of marching of mixed bodies of troops.

Diagonal lines may be drawn across the paper showing any rate of marching required. It is obvious that the quicker the rate the steeper will be the descent of the diagonal lines.

It simplifies reference to the map to place in the left-hand margin opposite the miles all villages on and off the road to a distance of two or three miles, cross-roads, side tracks, river and railway crossings, and steep gradients on the main road. As the scale of distance is the same as that on the map, viz., half inch to one mile, this is easily done by a clerk with the aid of a measuring wheel or pair of dividers.

The starting-point for No. 1 brigade area is Alton Church, and the time for the head of the troops in that area (viz., No. 1 Group) to pass that point is 8 a.m.² This point A is fixed on the Graphic, and a diagonal line drawn at the rate of 3 miles per hour—A B.

The length of No. 1 Group in column of route is $2\frac{1}{2}$ miles (see Appendix A), and this is represented by the line A C. It is obvious that as the tail of the group marches at the same pace as the head, the line C D must be drawn parallel to A B.

Now the line C D shows the march of the tail of No. 1 Group, consequently, if the head of No. 2 Group marches on the same line or an extension of it, it follows that the two groups will be contiguous on the road.

It is, therefore, necessary to extend the line C D until it cuts the starting-point of Group 2, viz., at E, and this will automatically give the hour of start of Group 2, viz., 7.25 a.m., so that, on resumption of the march, the head of Group 2 will fit on exactly with the tail of Group 1.

Similarly, again, the length of Group 2 in column of route is $2\frac{1}{4}$ miles (see Appendix A). The line E F is drawn $2\frac{1}{4}$ miles long, and the diagonal line F G at 3 miles per hour, or parallel with E C D and A B.

Where the starting-point of No. 3 Group cuts the line F G, viz., at H, gives the hour of start of No. 3 Group.

The same applies to No. 4 Group, but in this case different arrangements have been made to exemplify the crossing of a cavalry brigade between Nos. 3 and 4 Groups, as will be explained later.

By the above method it can be arranged with accuracy and simplicity that the whole division becomes contiguous on the road with a minimum of orders, delays, blockage, or friction.

The Graphic as worked out above is open to criticism, as it is not absolutely accurate. For instance, troops do not actually march at the rate of 3 miles per hour. They march at the rate of 100 yards in 1 minute, or 3 miles in 51 minutes, and then halt for 10 minutes. If, therefore, it is desired to show a high degree of accuracy, it is better to show a pace of 3 miles in 50 minutes by a steeper diagonal, and a 10-minutes' horizontal line for the halt every hour. This is exemplified in the third day's march.

² The season is assumed to be winter.

It may be of interest to note that after repeated timing of mixed bodies of troops on the march on a normal road, it has been found that the pace seldom varies much, and lies between 17 and 18 minutes to the mile, and this variation depends on the gradient.

Human and other errors are bound to upset the most accurate calculations, and it is considered advisable, if the tactical situation permits, to allow a certain amount of play, say 10 minutes, between groups. This is shown in the third day's march at the letter P, the letter Y denoting the 10-minute halts.

But, even in the third day's march, the calculation is not absolutely accurate, as it is based on the assumption that the troops march 3 miles in 50 minutes, whereas this distance is covered in 51 minutes. Consequently, in a march of 15 miles, a total error of about 5 minutes will appear. This is not, however, of very great importance. Absolute accuracy should not necessarily be aimed at; it will be sufficient if a degree of working accuracy is attained.

It is questionable whether the accuracy attained by the system adopted for the second day's march is not sufficient for all practical purposes. If a 10-minute margin is allowed in making all calculations for crossing columns, deployment, &c., it would appear to be accurate enough. A 10-minute margin does not involve a great waste of time during the day's operations, and if every calculation can be worked to an accuracy of 10 minutes, the result would certainly be satisfactory.

For all ordinary purposes, then, it would appear that the system adopted in the Graphic for the second day's march is sufficiently accurate, but that, if a high degree of accuracy is required, it would be preferable to use the system applied to the third day's march.

The operation orders for the march will be very simple. If the destination is not to be kept secret, a march table can be issued for the whole three days, otherwise it will be necessary to issue orders daily.

For the second day the orders would be :

Brigade Area.	Starting Point.	Hour.	Route.	New Quarters.
No. 1 ...	Alton Church ...	8 a.m.	Alton. Golden Pot. Odiham. Hook. Mattingley.	Billets :— Mattingley to Golden Pot. (These would be inserted in detail where possible.)
No. 2 ...	Road Junction, Point 474	7.25 a.m.		
No. 3 ...	Road Junction, Temple Farm	7.35 a.m.		
No. 4 ...	Road Junction, Greatham Mill	8.10 a.m.		

For the third day :

Brigade Area.	Starting Point.	Hour.	Route.	New Quarters.
No. 1 ...	Road Junction, Hound Green	8 a.m.	Swallowfield...	Reading and Vicinity
No. 2 ...	Hook Cross Roads	8.3 a.m.	Three Mile Cross	
No. 3 ...	Hook Cross Roads	9 a.m.		
No. 4 ...	Four Lanes, end cross roads	8.20 a.m.	Reading ...	S. of R. Blackwater

In addition to the above it will be necessary to insert an information paragraph, also that relating to the train, road, refilling point, &c., and to state where reports are to be sent to.

There will be no necessity to mention the advanced guard (Field Service Regulations, Part I, paragraphs 67 and 68). The commander of the advanced guard will receive instructions as to engaging the enemy if the latter is met in force.

It is of great importance that orders should be issued as early as possible, so as to allow the staffs of smaller formations and adjutants to issue their own orders and get some rest. In a march of this description, the orders ought to be issued within a few minutes of the decision as to the destination of the next day's march being reached. If the orders must necessarily be delayed, then of course a preliminary order must be issued. The staff must remember that the orders have to filter through to the company orderly-sergeant, and this takes time. There is nothing that causes so much distress to the troops as a hurried start.

Let it be supposed now that the main body of the division is marching contiguous along the main road from Alton to Reading. It will be seen at once from the Graphic that the head of the main body, during the second day's march, will reach the Basingstoke Canal just north of Odiham at 10.40 a.m., that, at the same moment, the head of No. 2 Group (viz., the 4th Guards Brigade) will be opposite Four Lanes End, that the head of No. 3 Group (viz., the 6th Infantry Brigade) will be approaching the road junction half-a-mile north of the Golden Pot cross-roads, and that the head of the brigade ammunition columns has not yet reached Alton.

Similarly, it may be ascertained at once from the Graphic at any point on the road or at any time of the day where each portion of the division is.

It is obvious that reference to the Graphic will be useful either

in the case of deployment, or if it is desired to make a detachment to the flank, or to march the division on a broader front. For instance, it can be ascertained at once, and without trouble, which units can, without counter-marching, use the roads leading north-westwards towards Upton Grey and Maplederwell, when the head of the main body has reached the canal about Odiham. It may be necessary to divert the 6th Infantry Brigade to Basingstoke, and, in this case, it would be necessary for the brigadier to receive his instructions to march to Basingstoke before 10.40 a.m., viz., the hour at which the head of his brigade would reach the road junction half-a-mile north of the Golden Pot cross-roads.

It may be decided to keep the brigade ammunition columns back in Alton. In this case it will be seen that they must receive instructions to that effect before 10.50 a.m., the hour at which they would reach that village according to the Graphic. If a cyclist (riding at the rate of 8 miles per hour) is despatched by the General Officer Commanding with a message to the above effect, he must leave the head of the main body not later than 10 a.m.

A line K B drawn at 8 miles per hour from the point Alton (10.50 a.m.) will strike the head of the main body at 10 a.m.

The time allowance or margin must, however, not be forgotten. As stated above, an inaccuracy of 10 minutes must be allowed for. The cyclist should therefore start not later than 9.50 a.m.

The crossing of columns generally presents some difficulties to the staff, and is a frequent source of delay, blockage, and waiting on the part of the troops. A cavalry brigade and horse artillery battery crossing the line of march of the division on the second day is depicted on the "graphic."

The data available is as follows :—

The cavalry brigade and horse artillery battery are marching at the rate of 5 miles per hour. The length of their column is 2,420 yards, or $1\frac{3}{4}$ miles. They are marching from the western flank via Herriard and Froyle to Frensham, and will cross the line of march of the division at the Golden Pot cross-roads at 11 a.m.

The march of the division had already been arranged for, the head of the main body to start at 8 a.m., and it is undesirable to alter this hour. The question, therefore, arises as to how much of the division can be passed across the Golden Pot cross-roads before 11 a.m., and how much longer that portion, which cannot be passed in front of the cavalry column, can be kept in their billets to avoid waiting on the roadside.

On looking at the Graphic it will be seen that the tail of the third group will clear the Golden Pot cross-roads at 10.50 a.m. (R on the Graphic), so that there will be no necessity to alter the arrangements for the march of the first three groups. The cavalry column must pass between Nos. 3 and 4 Groups.

Now, if the head of the cavalry column reaches the cross-roads at 11 a.m. (S on the Graphic), it follows that the tail will be $1\frac{1}{2}$ miles away (T on the Graphic), since the length of the cavalry column is S T. The lines V S and T W, drawn at the rate of 5 miles per hour, show the head and tail respectively of the cavalry column on the march. When the tail reaches W it will be clear of the cross-roads. Allow a safety margin of 10 minutes, W Q, and the point Q, viz., 11.30 a.m., denotes the first possible moment that the head of No. 4 Group can reach the cross-roads.

Now draw a diagonal through Q at 3 miles per hour, and where it cuts No. 4 brigade area starting-point, viz., at N, gives the time of starting of that group, namely, at 8.10 a.m.

A cyclist is left at the Golden Pot cross-roads to see the cavalry column go by, and, when it has cleared the cross-roads, he is to bicycle at once and report to the head of the main body.

When may this cyclist be expected ?

He leaves the cross-roads at W (11.20 a.m.) and cycles at the rate of 8 miles per hour (on the line W U), and does not reach Mattingley until 12.30 p.m., i.e., 25 minutes after the head of the main body has reached its billets.

During the third day's march, a staff officer is sent back at 9 a.m., during the first halt, to the tail of the column to see that the whole column is correctly formed, and is then to return to headquarters.

He is riding at about 5 miles per hour, and it is desired to know when he may be expected to return to headquarters in Reading.

The lines Y K, K L, at 5 miles per hour, show that he should reach Reading at 12.50 p.m., and that he will probably be away from headquarters for 3 hours and 50 minutes.

The line Z Z represents the head of the main guard of the advanced guard on the third day's march. It is desired to send at 8 a.m. a message to the advanced guard commander by cyclist orderly. The message is important, and the return of the cyclist bearing the receipt must be watched for.

When may he be expected to return ?

He cycles at 8 miles per hour on the line A Z, reaches Z about 9 a.m., remains with the advanced guard commander for a quarter-of-an-hour to obtain the receipt, &c., and returns Z J, and may, therefore, be expected to arrive about 9.45 a.m.

In the third day's march it will be noticed that the halts always take place at regular stated intervals (Y), and that the march is always resumed at the hour, viz., at 9 a.m., 10 a.m., 11 a.m., &c. The system of marching for 50 minutes and halting for 10 minutes appears to be the simplest and easiest. The halts should be ordered by the commander of each group, and he should resume the march always when possible at the hour. It is of convenience to the

commander and staff of the division to know when units are halted, and when they are on the move.

In conclusion, it appears to be desirable to anticipate a few criticisms on this paper.

(1) *In times of peace there is always a tendency to acquire fixed ideas and to become academic and narrow-minded.*

This is undoubtedly true, but it must not be held to imply that details should not be worked out and discussed, and consideration given to the various methods of execution.

It is necessary to be, in some degree, academic in the discussion of problems involving questions of staff details.

(2) *A fixed order of march is contrary to the spirit of Field Service Regulations, Part I, paragraph 27.*

Attention is directed to the footnote in Appendix A. No normal or arbitrary order of march can be fixed in peace. This does not, however, imply that, during a march such as that described, when the local conditions and nature of the country have been ascertained, the order of march should not then remain the same from day to day.

The order in which the troops will probably be required to come into action will then be known and will decide the order of march. The intention of the writer is that, once the order of march has been decided, and the division is marching and billeting in depth from day to day, that order will, as a rule, remain the same.

(3) *The Graphic is too elaborate, and a staff officer would never have the time to draw it up in the field.*

Agreed, so far as this particular "graphic" is concerned, for it has been made elaborate for the specific purpose of description and explanation.

In the field, however, a piece of squared paper and a pencil is all that is necessary. A clerk can write in the hours and miles to scale. The drawing of the diagonal lines is the work of a few minutes, and does not even necessitate a ruler. A separate paper should be used for the Graphic of each day's march.

(4) *The rate of marching under certain conditions varies so much, that towards the end of the day's march the Graphic will be so inaccurate as to be valueless.*

This argument does not apply to the system of ascertaining the correct hour of start for each group or brigade area so as to obtain contiguity of the division on the line of march. It may, however, apply towards the end of a day's march in the event of a desire to determine the particular points on the road reached by certain units at any given time.

In cases when the march is conducted in great heat, on sandy roads, or over ice or snow, an allowance must be made. This subject requires study, and is dealt with by Von Schellendorf in

considering the "rate of marching" in his "Duties of the General Staff," page 351.

(5) *There is no mention as to how the supply of the division is to be carried out.*

This subject has not been dealt with, as it forms a study by itself. The manipulation of the train and the various systems of feeding are of first-rate importance, and require the careful attention of all staff officers.

Finally, it will not be out of place to quote Von Schellendorf in his general remarks on the arrangements for marches :

"Errors of judgment or omissions in the applications of principles are sure to be followed by the most serious consequences ; for, apart from the risk of accidents, troops are generally harassed, without any reasonable excuse, by unnecessarily early starts, constant and wearisome halts on the march, and such like occurrences. . . . To issue instructions which should have been known beforehand to be impracticable, or impossible to comply with, is an unpardonable blunder. Mistakes of this kind can generally be traced to an imperfect knowledge of the lengths of the various columns and their rates of marching."

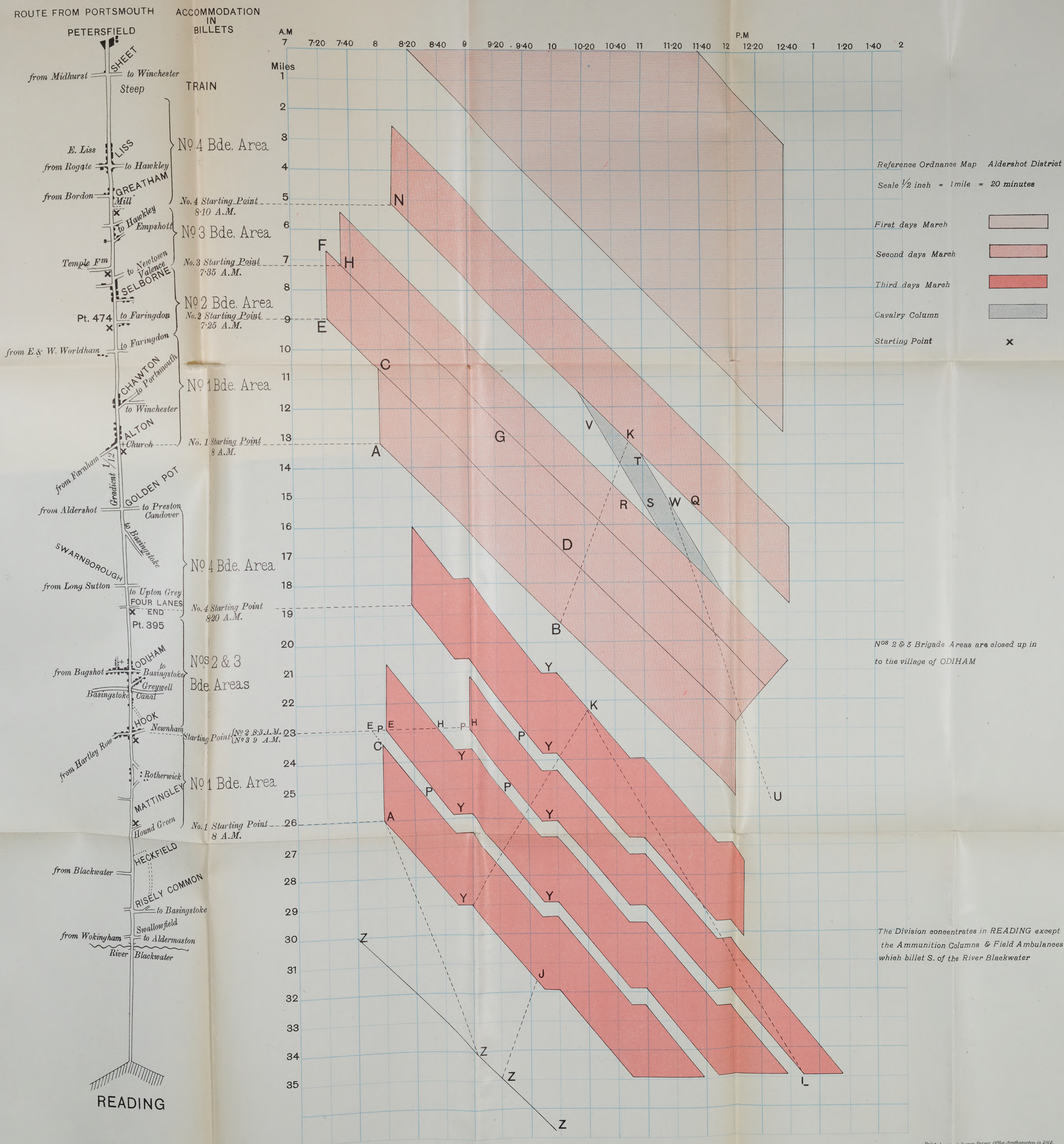
ALDERSHOT DISTRICT

APPENDIX "B"



APPENDIX "C"

GRAPHIC OF 2nd DIVISION MARCH FROM PETERSFIELD TO READING



APPENDIX A.

Advanced Guard.

A and B Companies M.I. (less 1 Section).	}	Commander : Brigadier-Gen. A., Commanding 5th Infantry Brigade.
5th Field Co., R.E. (less pontoon and trestle wagons).		
1 Battery, 31st Brigade, R.F.A.		
5th Infantry Brigade (less 1 Battalion).		
1 Section 5th Field Ambulance.		

Main Body.

Headquarters, 2nd Division, etc.	}	Group 1. Commander : Brigadier-Gen. B., G.O.C., R.A.
1 Section M.I.		
1 Battalion, 5th Infantry Brigade.		
11th Field Co., R.E., plus pontoon and trestle wagons of 5th Field Co., R.E.		
31st Brigade, R.F.A. (less 1 Battery and Ammunition Column).		
32nd Brigade, R.F.A. (less Ammunition Column).	}	Group 2. Commander : Brigadier-Gen. C., Commanding 4th Guards Brigade.
50th Brigade, R.F.A. (Howitzer, less Ammunition Column).		
4th Guards Brigade.	}	Group 3. Commander : Brigadier-Gen. D., Commanding 6th Infantry Brigade.
48th Brigade, R.F.A. (less Ammunition Column).		
6th Infantry Brigade.	}	Group 4. The Senior Ammunition Column Commander : R.F.A.
Heavy Battery (less Ammunition Column).		
Ammunition Columns.	}	Commander : A.S.C.
Field Ambulances (less 1 Section).		
Train 		

The length of the groups in column of route are as follows :—

Group 1	...	...	4,400 yards = $2\frac{1}{4}$ miles	} $9\frac{1}{4}$ miles.
Group 2	...	...	3,960 " = $2\frac{1}{4}$ "	
Group 3	...	...	3,060 " = $1\frac{1}{4}$ "	
Group 4	...	...	4,840 " = $2\frac{1}{4}$ "	

These require correction by the latest War Establishments.

NOTE.—The order of march must be fixed according to the local conditions of the campaign, and the nature of the country in which the operations are to take place. The above order and grouping are merely suggested for explanatory purposes.

X.

THE WOUNDED IN WAR.

By LIEUTENANT-COLONEL C. H. BURTOHAELL, M.B., R.A.M.C.,
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THE separation of the wounded from the mobile troops and their transfer to the rear of an army constitutes the principle known as Evacuation of the Wounded.

It is unnecessary to discuss the merits of this principle which has long been accepted as productive of the best results for an army as a whole and for the wounded themselves, and now forms the basis of all systems for the disposal of wounded in war.

DEVELOPMENT OF THE MEDICAL SERVICE IN ORGANIZATION AND TRAINING FOR DEALING WITH WOUNDED IN WAR.

In the British Army the development of field medical units organized with transport and designed on the principle of evacuation dates from 1877, when an Army Circular¹ was issued giving the composition and allotment in an Army Corps of bearer companies and field hospitals. The introduction into the Service of these units followed on the report of the Committee on the appliances for aid of the sick and wounded in war, presided over by Surgeon-General Sir T. Longmore, at the Brussels Exhibition, 1876.

The system then introduced resembled very closely the German organization and was probably the best, in many respects, on paper at all events, that has appeared in connection with our Army. A bearer company consisting of 8 medical officers, 39 officers and men of the Army Hospital Corps, 95 stretcher bearers, in addition to Army Service Corps details for transport purposes, bringing up the total strength of all ranks to 210, with 10 ambulance wagons in the 1st line and 23 local wagons for ambulance purposes in the 2nd line, was allotted to each division and one to Corps troops. Provision was also made for pack transports for these units.²

¹ Army Circulars, Clause 77 of 1877.

² Report on the appliances for aid to the sick and wounded in war in the Brussels Exhibition of 1876, and Army Circular referred to in Note 1.

There were 12 field hospitals, equipped for 200 patients each, per Army Corps—two attached to each division and six in reserve. Three of these units in reserve were provided with transport and kept in readiness to take the place of an immobilized field hospital in front. Regulations relating to field hospitals and the duties of the Bearer Column, which was the name then given to the four bearer companies attached to an Army Corps, were issued with Army Circulars, Clause 9, of 1878. These, as well as details of personnel, &c., above referred to, were embodied in the Medical Regulations of 1878.

The first bearer company actually employed in the British Service was one organized and trained in South Africa during the last phase of the Zulu War. It was composed of a few non-commissioned officers and men of the Army Hospital Corps and of Line regiments largely supplemented from native sources. It was commanded by Surgeon-Major J. Hector, and under him did excellent service at the storming of Secocoeni's stronghold in 1879.³ It was not until 1881 that a bearer company was organized for war complete in personnel and equipment according to the then existing Regulations. This company, under the command of Surgeon-Major William Johnston, M.D.,⁴ was in January of that year sent to Natal as a reinforcement during the Transvaal War, but owing to the cessation of hostilities was never actively engaged.⁵ Field hospitals and bearer companies of the 1877 organization were employed during the Egyptian War of 1882, but the following year the strength of both was reduced to one-half of their former establishment, and they became brigade units—one of each per brigade and one field hospital per division for divisional troops.⁶ These units were not an integral part of their brigades, and the Regulations directed that they were to be at the disposal of the divisional authorities for detachment or massing as required.

This organization continued until after the South African War, 1899-1902; but in March, 1905, the bearer companies and field hospitals were combined into the present field ambulances, which again became divisional units.

Until a few years before the South African War there was little or no training of medical units, as units, and combined training with troops was rare, although on several occasions in 1898 and 1899 the complete medical units of a division took part in special tactical exercises designed for their instruction in dealing with wounded.

³ The First Bearer Company. *Journal of the Royal Army Medical Corps*, Vol. XVI, p. 563.

⁴ Now Colonel William Johnston, C.B., M.D.

⁵ The Second Bearer Company. *Journal of the Royal Army Medical Corps*, Vol. XVII, p. 412.

⁶ This change was made on the recommendation of the Committee of Enquiry into the organization of the Army Hospital Corps, &c., presided over by the Earl of Morley. See pp. xxxii, xxxiii, and xli of its Report, 1883.

Regular annual training of field ambulances or portions of field ambulances began in most commands in 1905.

Resulting from a recommendation by the War Office Reconstitution Committee that an officer of the Royal Army Medical Corps should be attached to the General Staff at the War Office, Lieutenant-Colonel W. G. Macpherson, Royal Army Medical Corps, was attached, in December 1905, to the Section of the Director of Military Operations in the Department of the Chief of the Imperial General Staff. Colonel Macpherson subsequently did much to promote a knowledge of the medical organization and methods of training medical personnel in foreign armies.

In 1908 the Army Council issued instructions which initiated lectures for medical officers on the general principles of tactics, strategy, and administration, and in map reading. Special staff tours for practising medical officers in adapting their work in war to military requirements, and for bringing staff officers into closer touch with the medical service, were at the same time instituted.

The first Medical Staff tour ever held in the British Army took place in the Irish Command in 1908, under the direction of Major-General Sir H. Plumer and Surgeon-General G. D. Bourke. Since that year similar exercises have taken a prominent place in the instruction carried out annually in all commands. Lectures by officers on the staff of the Staff College on the principles of staff duties in the field were introduced as part of the instruction given to medical officers at the Royal Army Medical College, and later an officer of the Royal Army Medical Corps was appointed to deliver a course of lectures to the students at the Staff College on the work of the Medical Service. The next event of interest was the issue in 1909 of Field Service Regulations, Part II. This was the first book of general regulations for the Army containing a description of the organization of the medical service in war and the system of dealing with casualties in action. In 1910 "medical manœuvres" were held for the first time; this exercise took place near Salisbury Plain, under the direction of Major-General Sir Henry Rawlinson. The medical units and establishments of a division were mobilized with full personnel, equipment, and transport, and troops of all arms, representing a division, carried out a tactical scheme extending over three days. During the operations a large number of officers and men were labelled to represent wounded, and were dealt with by the medical units.

The 1911 edition of the Royal Army Medical Corps Training contained the first complete account of the organization of the medical service for dealing with wounded through all the successive stages of medical aid, with instructions as to the procedure to be adopted in the various tactical situations likely to affect the medical service in war.

Although the necessity for adequate training of the medical service in the work it undertakes in war has only lately been recognized, it must not be assumed that the methods of dealing with wounded which now find a place in official manuals are new. On the contrary, they are almost entirely based on old principles revived and re-shaped to suit modern conditions. Indeed there are few facts essential in building up an efficient system for the treatment, transport, and disposal of wounded soldiers which did not receive attention by officers of the British Army Medical Service of past generations, notably by the late Surgeon-General Sir Thomas Longmore in his works on ambulance transport and on gunshot injuries which were published in 1869 and 1877.

PRESENT ORGANIZATION FOR DEALING WITH WOUNDED.

Adopting the classification described by Longmore in 1877, which was previously used in the Austrian Army, the Field Service Regulations divide the medical organization in the field into three zones—(see Diagram 1):

- (1) The collecting zone.
- (2) The evacuating zone.
- (3) The distributing zone.

The medical establishments in these zones are as follows:—

- | | |
|-----------------------------|--|
| In the collecting zone .. | The medical establishment with units.
Field ambulances and cavalry field ambulances. |
| In the evacuating zone .. | Clearing hospitals.
Ambulance trains.
Stationary hospitals. |
| In the distributing zone .. | General hospitals.
Convalescent depôts.
Hospital ships.
Military hospitals in the United Kingdom. |

It will be seen from the diagram that these zones overlap, as the evacuating zone connects up the collecting zone with the distributing zone.

In order to give a general idea of this organization it will be best to omit, for the present, reference to cavalry field ambulances within the collecting zone and to deal only with the field medical units of a division and the regimental medical service of infantry.

The regimental medical service of an infantry battalion consists of 1 medical officer with 2 orderlies, 8 stretchers, and 16 stretcher bearers. The orderlies and stretcher bearers are trained in first aid during peace, and a certain amount of light medical equipment is provided. There is also a detachment of 1 non-commissioned officer

and 5 men R.A.M.C. attached to each infantry battalion for duty in connection with the water supply and sanitation. These men may or may not be available for assisting the wounded.

The field ambulance is composed of a bearer and tent division, with transport and equipment, and is divisible into three sections, each of which consists of a bearer sub-division and a tent sub-division.

The bearer division consists of 3 medical officers and 18 stretcher squads of 6 bearers each.

The tent division, which represents the old field hospital, is designed for the reception, temporary treatment, and care of wounded pending their transfer to hospitals on the lines of communication. The personnel consists of 6 medical officers, 1 quartermaster, and non-commissioned officers and men for nursing, cooking, and general duties.

Every field ambulance has 10 four-horsed ambulance wagons, each of which can carry 4 men lying down or 12 sitting.

Three field ambulances are allotted to each division.

Clearing hospitals are new units, in name at all events, in our Army, and generally speaking their utility is not, as yet, well understood. It will be well, therefore, to consider the general principle underlying their use and functions, and see how it was dealt with in the past.

The field medical units, such as field ambulances, must be ready to move with the fighting troops, complete in numbers, personnel, and equipment, should an advance take place after a battle. This cannot be done if they have to provide detachments to accompany the wounded transferred towards the base while a battle is in progress, or if, when the battle is over, they still have wounded on their hands to care and provide for pending, or during, evacuation to the hospitals on the lines of communication.

In the 1877 organization of medical service, referred to above, the field hospitals under Army Corps control were moved up and took the place of divisional field hospitals which became immobilized during an action. This system is followed at the present time in certain Continental armies. The personnel for taking care of the wounded in transit from field hospitals to the line of communication hospitals was provided for under directions from the Surgeon-General and the Field Inspectors of the medical service on the lines of communication. More recently, during the South African War, a stationary hospital was moved up to the battlefield at Colenso to act as a clearing hospital.

Instead of having reserve or duplicated field medical units, the clearing hospital was introduced as a unit on the line of communication to take over direct on the field any wounded remaining with the field ambulances when those units are required to move forward,

and also to provide personnel to conduct the wounded from the field to the railroad.

Should the field ambulances remain stationary during a battle lasting several days, the clearing hospital would probably be placed at railroad to receive the wounded brought in by any form of transport in use, and from it would be sent out detachments to accompany the wounded on their journey from the field, and to establish, if necessary, posts composed of a few non-commissioned officers and men at the points where the wounded are loaded on the wagons for conveyance to railroad, or at halting places between the two.

The personnel of a clearing hospital consists of 8 officers and 77 other ranks; it is in reality a stationary hospital with field stretchers instead of bedsteads, and is provided with other equipment on a scale sufficient to accommodate 200 patients. It is not, in the ordinary sense of the word, a hospital, as it is not intended to retain sick or wounded except on the battlefield, pending provision of means of conveyance from the field or at railroad while they are awaiting ambulance or other trains to convey them to the stationary or general hospitals.

Transport required to convey the equipment of a clearing hospital from place to place, or to carry wounded from the battlefield to railroad, is provided under the orders of the Inspector-General of Communications.

Ambulance trains with accommodation for 100 lying down cases are mobilized in the proportion of one for each division.

General and stationary hospitals are organized on a basis of 200 and 520 beds respectively. They are placed where required on the lines of communication and at the base, and together with convalescent depôts and military hospitals in the United Kingdom, they fall within the distributing zone.

Hospital ships equipped for 220 patients, including 20 officers, are mobilized in the proportion of one for each division of the field army when engaged in an over-sea war. They, with ordinary transports, form a link between the base and the military hospitals in the United Kingdom.

SYSTEM OF DEALING WITH CASUALTIES IN ACTION.

During an engagement, the regimental medical detachments render first aid to the wounded and remove them, if possible, from the firing line, place them under cover, and when circumstances permit establish regimental aid posts where the wounded are collected with a view to being taken over by the field ambulance personnel.

The stretcher squads of the bearer division of the field ambulances keep in touch with the regimental medical service and carry the wounded from the vicinity of the firing line, or from the regimental aid posts, to a point up to which the ambulance wagons can be brought.

When the tent sub-division or portion of a tent sub-division is opened at this point it is known as an advanced dressing station. From the advanced dressing station the ambulance wagons convey the wounded to the tent division or sub-divisions forming the dressing station.

Slightly wounded men able to walk are sent from the advanced dressing station to a post known as the divisional collecting station which is formed by a tent sub-division or other detachment of an ambulance away from the line of evacuation for wounded who require transport by hand or ambulance wagon.

The slightly wounded may be formed into squads under any officers or non-commissioned officers, who, although themselves wounded, are not incapacitated from assisting in maintaining discipline, and the squads so formed may be despatched to railhead on foot or in any available wagons.

When a railway is close to the battlefield, ambulance wagons of the field ambulances not required to work in advance of the dressing station may be used to carry wounded to railhead or to an entraining point.

If railhead is at a distance from the battlefield, the removal of the wounded from the dressing station to the railway rests mainly with the line of communication authorities. A clearing hospital is sent forward, and means of transport sufficient and suitable for the number and class of wounded is provided under arrangements made by the director of transport and the inspector-general of communications, co-ordinated at general headquarters by the quartermaster-general's branch of the Staff.

The empty supply vehicles returning to replenish may be utilized and, when necessary, additional vehicles will be obtained, by hire or requisition, or wounded convoy sections may be specially organized and attached to the clearing hospital. The director of medical services arranges for the temporary fitting up of supply or other vehicles allotted for the conveyance of wounded, but no special fittings for this purpose are kept in readiness during peace.

With the aid of Diagram I, we may now follow the course of a severely wounded man from the battlefield.

1. He is first dealt with by the regimental medical service, being carried, if possible, to an aid post by the regimental stretcher bearers.

2. He is next taken over by the bearer division of a field ambulance and is again carried on a stretcher to the advanced dressing station. He should not be removed from the stretcher on which he is first placed: the field ambulance bearers take over the stretcher with the man and give a stretcher in exchange to the regimental bearers.

3. From the advanced dressing station he is conveyed by ambulance wagon, still on the same stretcher, to the dressing station or main establishment of the tent division of the field ambulance.

4. From the dressing station to railhead he may be transported by any of the following means according to circumstances :—

- (a) If railhead is near the dressing station he may go direct by ambulance wagon—centre of diagram—provided all those wagons are not required to work in advance of the dressing station.
- (b) If local conveyances are being used he may be placed, at the dressing station, in whatever form of vehicle is employed—left of diagram—and carried direct from there to railhead. If it is not convenient or practicable to load him on this means of transport at the dressing station, he is conveyed by ambulance wagon to a point, not far from the dressing station, where the local transport is collected—shown at the arrowhead on left of diagram—and from there sent on to railhead.
- (c) If the motor transport of the supply column is available, he is taken by ambulance wagon to the vicinity of the re-filling point—arrowhead right of diagram—or to any other convenient point that may be arranged for loading the wounded on the motor lorries, or he may, under certain conditions, be carried to the loading point by the general service wagons of the divisional train.

5. From railhead he is conveyed by ambulance train, improvised ambulance train, empty goods train, or in an ordinary passenger coach—if of a suitable type—to a stationary or general hospital on the lines of communication or at the base.

6. From these hospitals he is again conveyed by train to the place of embarkation, or by ambulance wagon if already at the base and a railway does not connect the hospital with the docks or wharf, and placed on board a hospital ship or a transport fitted for invalids for passage to home territory.

7. On arrival in home territory he is sent to a military hospital. When no longer requiring hospital treatment, but not sufficiently recovered to return to duty, he is discharged to a convalescent dépôt.

A wounded man whose condition does not necessitate his transfer to home territory may be discharged to duty from any one of the medical units established between the fighting line and the base. Slightly wounded men likely to be fit to rejoin the ranks after a short period of hospital treatment should not be sent far down the line of communication. Although this principle is not of the same importance where there is a good railway service as it is when in the case of a long line of communication by road, still the time and labour involved in loading trains and the demands likely to be made on available rolling-stock should be considered.

It is not intended to discuss the various conditions which influence

the tactical distribution of the field medical units, but a few of the possible dispositions are represented in Diagram II. It must be taken as purely diagrammatic and not as suggesting that the stretcher bearers or the three field ambulances of a division would be necessarily so placed in relation to each other, but that any one field ambulance might be employed in one of the ways represented. For instance, the situation on the left shows a field ambulance with one tent sub-division pushed forward as an advanced dressing station, another tent sub-division acting as a main dressing station, from which wounded are being transferred to railhead by some of the possible methods previously referred to, while the third tent sub-division is detached to form a collecting station for slightly wounded. The situation in the centre shows a dressing station formed by two tent sub-divisions without an advanced dressing station, and the third tent sub-division detached to receive wounded brought by ambulance wagons to an entraining point on a railway line. On the right, one tent sub-division is acting as a dressing station, while the other two tent sub-divisions of the same field ambulance are standing fast in reserve awaiting orders to open wherever the progress of the action may require, or to move forward if the troops advance.

This principle of keeping some tent sub-divisions in reserve, and also of not opening any portion of a tent division to form a dressing station too soon, is important.

A dressing station opened during the early stages of a battle may be badly placed and at an unnecessarily great distance from the firing line when the fight develops and the fighting troops become more or less stationary on a definite line, beyond which they cannot progress. The movement, position, and method of using a field ambulance are largely influenced by the conditions of battle, *i.e.*, whether an encounter battle, defence of a position, or an action during a retirement.

The collecting station for slightly wounded, marked in the centre of Diagram II, is shown as receiving wounded from the advanced dressing station and the dressing stations, since it is desirable to pass all wounded able to walk through one of those posts. This course is recognized in one part of the Regulations on the subject, but in another part direct transfer from the regimental medical service to the slightly wounded post is contemplated. This involves a consideration of what the regimental medical service really is. In the infantry of our Army we have no regimental medical service in the sense of that expression applied to foreign armies. We have only a battalion service. In almost all foreign armies there are two medical officers to each battalion with battalion stretcher bearers in about the same proportion as in our own Army. A group of three or four battalions form a regiment to which is allotted a regimental medical officer in addition to the medical officers in the proportion of two per battalion, and a varying number of trained personnel

of the medical service. As a rule, one medical officer, with a proportion of the stretcher bearers and medical service orderlies, accompanies each battalion into the fighting line, and the other battalion medical officers, with the remaining stretcher bearers and medical personnel, remain behind to form a regimental aid post or dressing station under the regimental medical officer. Thus there are two échelons of the regimental medical service.

The regimental medical service of infantry in the French Army is fairly typical. It consists of a regimental medical officer with, in a four battalion regiment, 8 medical officers, 16 hospital orderlies, 64 stretcher bearers (4 per company), 1 non-commissioned officer of stretcher bearers, and 38 bandsmen, who are assistant stretcher bearers. On going into action the personnel is distributed thus: 1 medical officer, 2 hospital orderlies, and 5 stretcher bearers are distributed amongst the companies of a battalion and go into the firing line with it, the medical officer and one orderly going with the first company. They keep in immediate contact with the troops, following all their movements and utilizing any cover available. When possible they form "refuges de blessés" close behind each company, or render first aid at such posts which often automatically form themselves by wounded men collecting at points not exposed to fire.

The rest of the regimental medical service remains behind the battalions, and when the action has definitely begun, or when the number of wounded is considerable, they form the "poste de secours du régiment."

It is from this regimental dressing station, which corresponds in a way to an advanced dressing station in our Army, that the slightly wounded are received and despatched to the collecting station.

Our Regulations contemplate a kind of combination of the battalion aid post and the regimental dressing station, but with the personnel available it would not be possible to establish both in such a manner that all slightly wounded men able to make their way back from the firing line would pass under the supervision of the battalion medical officers. Therefore, unless these men are dealt with at the advanced dressing station or dressing station, before despatch to the collecting station for slightly wounded, there is considerable risk of many getting away to that distant point who could return to the firing line after their wounds are dressed.

The regimental, battalion, or first line medical service is very important from a fighting point of view, because if of reasonable strength and well organized it checks to a great extent effective men leaving the firing line to assist wounded to the rear and prevents slightly wounded who only require minor dressings getting out of touch with their units. Any *general* movement of stretcher bearers near the firing line during a battle is out of the question, and likely

to become more difficult as time goes on and weapons develop in precision, length of range, and lowering of trajectory.

While generally speaking this is so, it is equally certain that there will be in the future, as in the past, many points close to the troops in action where the ground well affords protection. There, wounded men will congregate, whether directed to do so or not, and in numbers proportionate to the extent of protected space available. To remove the wounded thus collected may or may not be possible. In either case much depends on the efficiency of the regimental medical service not only in preventing avoidable loss of strength in the firing line, which should be the primary consideration, but also rendering first aid and treating seriously wounded to the fullest extent practicable.

Many years ago a distinguished German surgeon said that "the fate of the wounded rests in the hands of the one who applies the first dressing." The importance and essential truth of that observation cannot be exaggerated both from a military and a surgical point of view. The correct application of the first field or other dressing, and adequate fixation of fractures by the regimental medical services, is of the utmost importance so far as the fate of the wounded man himself is concerned, and it also means an enormous saving of time in clearing the wounded to the rear when the battle is over, as re-dressing at field ambulance establishments will in many cases be unnecessary and the results of delayed or improper surgical aid, which tend to prolong the duration of hospital treatment, will be avoided.

The tendency, therefore, at the present time in most foreign armies is to develop the regimental medical service. The regimental stretcher bearers in the French, German, and Austrian Armies have recently been made additional to the company establishments, and they now wear the Red Cross brassard instead of the stretcher bearer armlet which does not afford protection under the Geneva Convention. The change tends to ensure more efficient first aid, and continuity of employment as part of the regimental medical establishment. Bandsmen, employed as stretcher bearers, are additional or auxiliary bearers in the Armies just referred to.

The medical service with cavalry differs from that of infantry. The Cavalry Field Ambulance is composed of a bearer and a tent division divisible into two sections, and has 6 medical officers, 6 stretcher squads of 4 bearers each, some tent personnel, 6 light two-horsed ambulance wagons taking 2 cases lying down or 8 sitting up, and 4 heavy six-horsed ambulance wagons each carrying 4 lying down or 12 sitting up, or 2 lying and 6 sitting. Four cavalry field ambulances are allotted to the cavalry division and one to each mounted brigade. There is one medical officer to each cavalry regiment and two men per squadron are trained in first aid. The light ambulance wagons

DIAGRAM I SHOWING THE VARIOUS ORGANIZATIONS THROUGH WHICH A WOUNDED SOLDIER MAY PASS FROM THE FIGHTING LINE TO HOME TERRITORY OR BEFORE RETURNING TO DUTY AT THE THEATRE OF WAR.

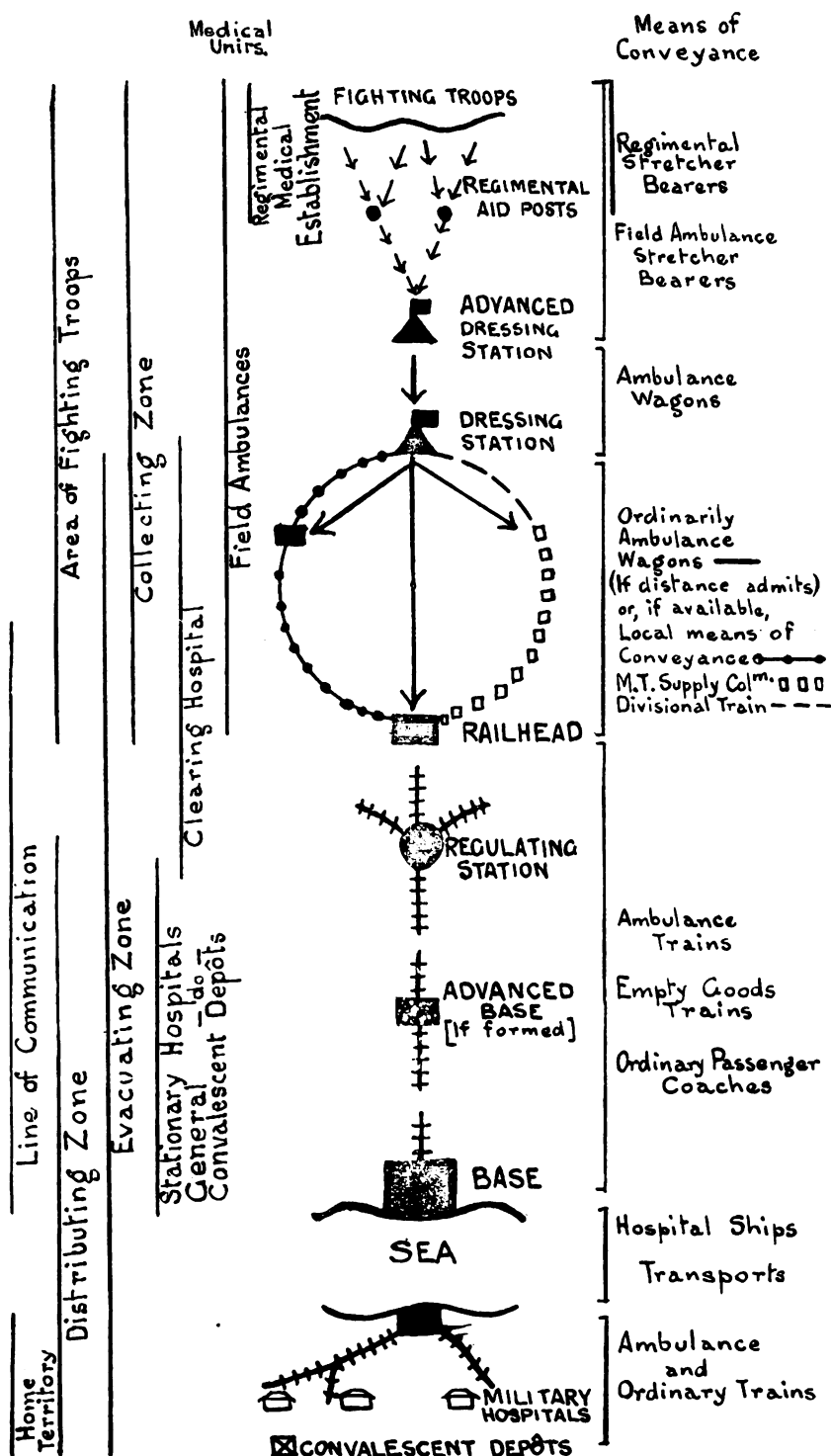
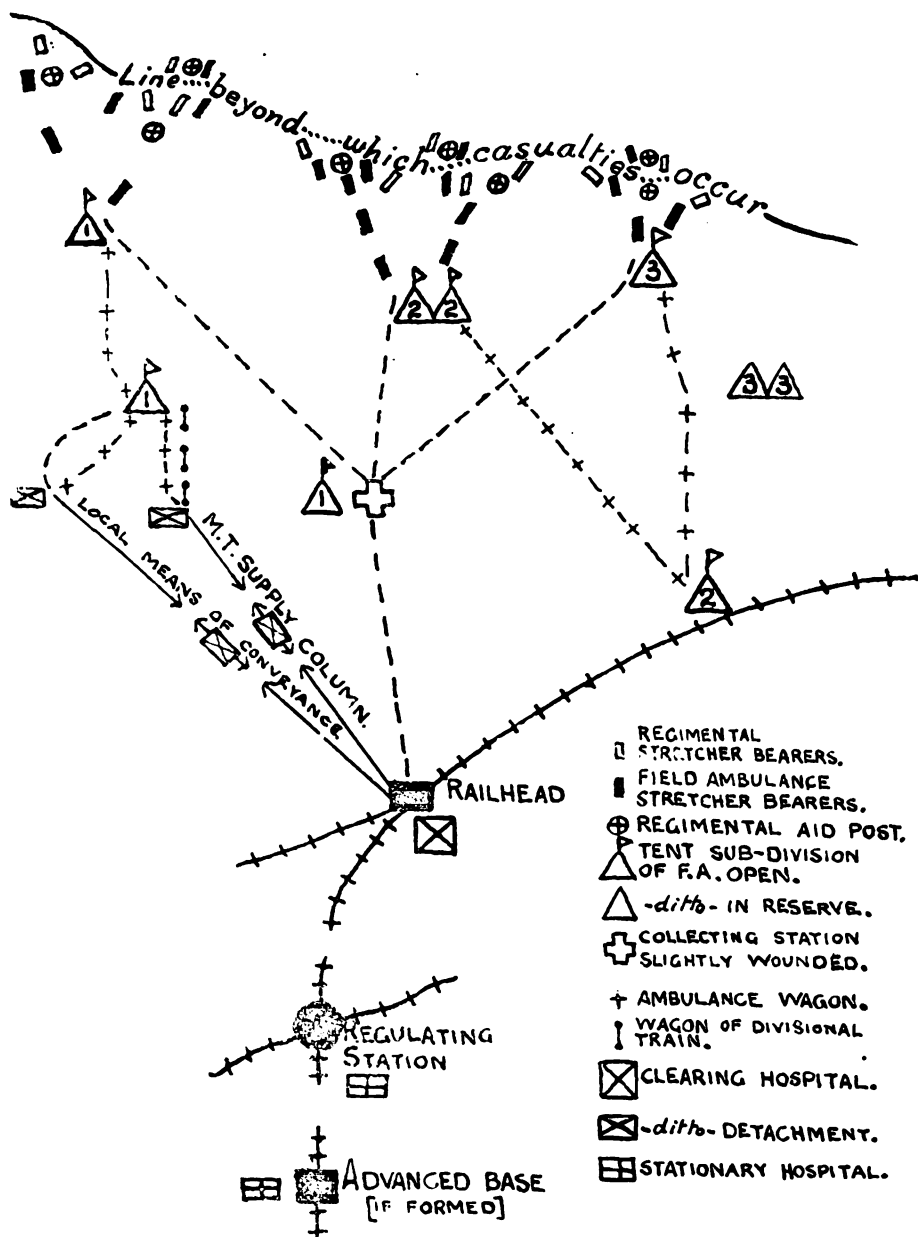


DIAGRAM II
 SHOWING POSSIBLE SITUATIONS OF THE MEDICAL
 SERVICE OF A DIVISION DURING A BATTLE AND
 ALTERNATIVE MEANS THAT MAY BE AVAILABLE FOR
 THE EVACUATION OF WOUNDED.



(Not drawn to scale)

of the Cavalry Field Ambulance are distributed to regiments and placed under the orders of the regimental medical officer, when circumstances render that course desirable. They are intended to bring cavalry soldiers, wounded during operations involving dispersion, to points called collecting posts which are established for their reception by the Cavalry Field Ambulance. From the collecting posts the wounded are carried in the six-horsed heavy ambulance wagons, which are so constructed that, in addition to providing means of transport, they are suitable for affording temporary shelter for the wounded.

There are many interesting and important points relating to the work of the medical service in connection with wounded which it has not been possible to refer to in this paper—the object of which is to give a general idea of the present organization, rather than to enter into a discussion of details and problems which affect the medical and other administrative services.

XI.

THE ARMY ORDNANCE DEPARTMENT AND CORPS.

By BRIGADIER-GENERAL T. PRESTON BATTERSBY, Inspector of Army Ordnance Services.

“HAPPY is the country that has no history,” is a saying of very wide acceptance. If we can obtain the assent of our readers to the further aphorism—“Efficient is the department which works so smoothly that its existence is generally ignored”—this article will not have been written in vain. It is a marked characteristic of human nature to take for granted—as part of the natural order of things—any incident which occurs with regularity, and is not interrupted by the unforeseen. We arrive at our London offices by the early morning express trains with unfailing punctuality (provided we are not unfortunate enough to be dependent upon the tender mercies of the South Eastern and Chatham Railway), and which of us pauses to think of the labour and thought, the time charts and signalling problems involved in each apparently simple journey? Our letters are brought to our doors by the postman, and if he should be 10 minutes late we grumble; but who considers the vast complexity of the system which had to be evolved before it was possible to ensure that a letter posted anywhere in the civilized world should punctually reach its address?

So, in the Army, we march to a camping ground and find our tents awaiting us. We mobilize for active service and are provided with our due allowance of all stores necessary for our efficiency. We fight a battle and expend enormous quantities of ammunition—gun and small arm—and find fresh supplies awaiting us. We put forward indents for strange and unmilitary articles, such as feminine apparel for the occupants of a Boer concentration camp, and supply is made from some mysterious source. The average soldier—if he thinks at all upon the matter—has a vague idea that these supplies come from certain places known as Woolwich and Pimlico, where inexhaustible stocks exist of all stores that can possibly be required. Should he not receive thence exactly what he wants, at the earliest possible moment, it is merely due to the “cussedness” of a being called the

"Ordnance officer," whose chief occupation is believed to be sitting at an office desk and writing minutes calling for wearisome and useless returns.

As for the general public, *it* does not recognize the existence of the Army Ordnance Department at all, but has a confident belief that it is only a name for a branch of the Army Service Corps. This belief no doubt dates back to the old Control Department days, and is on a par with that still very generally held by folk who should know better, that the British Army is a collection of drunken and foul-mouthed ruffians, amongst whom it is a terrible degradation for the son of a respectable farmer to find himself!

When we consider the undoubted fact that the distrust of a standing army still prevalent amongst large bodies of our fellow countrymen owes its origin to the doings of the Army of the Commonwealth, we can scarcely hope to combat such misconceptions during the lifetime of one generation. Nevertheless, it is hoped that this article may be the means of conveying—to a few minds at least—more accurate ideas as to the character and functions of a very important and much underrated branch of the service.

The chief difficulty of writing on so large a subject is that there is a natural tendency towards the accumulation of interesting detail, which is very liable to lead to the well-known dilemma—the wood cannot be seen for the trees! To avoid this, we propose to bring forward as few dry statistics as possible, and to ask the indulgence of our readers for those which we must of necessity introduce. If we fail to make the subject interesting it is our own fault—not that of the theme.

The genealogical history of the Army Ordnance Department need not detain us long, being naturally of more interest to those serving in the latter than to outsiders. The Department is lineally descended from the Board of Ordnance, which appears to have been founded in the reign of Richard III, and from which the Royal Artillery, the Royal Engineers, and the Transport Service can also trace descent. The Army Ordnance Department uses the arms of the old Board of Ordnance, granted in 1806, viz. : Azure—three field pieces in pale Or. On a Chief Argent three cannon balls Sable. Crest—out of a Mural Crown a dexter hand holding a thunderbolt all proper, together with the Motto "*Sua tela tonanti.*" Supporters—on either side a cyclops : in the exterior hand of that on the dexter a hammer, and in that of the sinister a pair of forceps resting on the shoulder of each respectively, all proper.

The arms have been adopted by the Army Council for use in their flag, which may be seen flying on the roof of the new War Office in Whitehall. There is a very well executed reproduction of the above heraldic description, in stonework, in the Tower of London. The motto is a little difficult to translate, in the absence of a verb. It

may be a quotation from the classics, but, if so, its source is unknown to the writer. Possibly some reader of THE ARMY REVIEW may be able to trace it. The omission of words from heraldic mottoes often causes the latter to form excellent conundrums. We remember consulting many Latinists as to the meaning of a sentence inscribed on an old cannon at Government House, Barbados—"Haec generi incrementa fides." No one could translate it. Years afterwards we found it to be the motto of the Townshend family, and to be intended to read—"Fidelity obtained these honours for our race!"

In 1825 the Store Branch of the War Office was managed by civil officials, called "Ordnance storekeepers," permanently located at stations. In 1857 the Store Branch gave place to the Military Store Department, whose officers were styled "Military storekeepers," and were movable from station to station. In 1861 this civil establishment was reorganized and its officers given commissions. They were called "Superintendents of Stores," with relative rank. About 1875, after passing through the stage of the Control Department, the Ordnance Store Department was separated for ordnance duties, and, finally, in 1881, the Ordnance Store Department and Corps were formed, and it was determined to officer the former by degrees from combatant officers of the Regular Army.

The present writer was one of the first officers to join under the new conditions. It is believed that the intention at the time was to select officers from the Royal Artillery only, but that, after three officers of that Corps had joined, the Deputy Adjutant-General Royal Artillery objected to allowing more to leave their regiment, and entrance was then opened to the Cavalry, Infantry, and Royal Marines.

We had at that time exceedingly cumbrous titles. The writer at one period might have appended to his name, in his official signature, "Captain Royal Artillery, Deputy Assistant Commissary General of Ordnance, Senior Ordnance Store Officer Windward and Leeward Islands!" For some years after his joining, the new Department was also curiously independent of generals commanding, who had no power whatever to order issues of stores, or to interfere in any way with the internal working of the Ordnance Office. In 1895 the Corps of Armourers was transferred to the Ordnance Store Corps, and, in the following year, the Armament Artificers of the Royal Artillery. The designation of the Department and Corps was now altered to "Army Ordnance Department" and "Army Ordnance Corps," the cumbrous titles were abolished, and those at present existing substituted. Since that date the Department and Corps have become a true military branch of the service, and have yearly advanced in efficiency, in which they have now reached a very high standard.

The functions of the Department are the supply to the Army, in peace or war, of everything it requires, with the exception of animals,

food, forage, fuel, medicines, and surgical instruments; the examination, repair, and conversion of all stores (including arms) used for Army service; the examination at out-stations of gunpowder, cordite, guncotton, fuzes, tubes, and munitions of war, and all laboratory operations connected therewith; and certain duties in connection with Naval services to which we need not refer in this article. The Army in India is, at date of writing, supplied by its own Ordnance Department, but is provided with armourers, inspectors of Ordnance machinery, and machinery artificers by the Home Department.

This constitutes a formidable programme of duties, and it will be evident at a glance that, on their faithful performance largely depend the efficiency of the Army as a fighting machine and the whole conduct of a campaign. Clearly it is most necessary to have an intelligent, well-educated, and thoroughly trained body of officers and men to carry out such work, and we will commence our article by explaining, in some detail, the methods at present in use for obtaining such a body.

Three varieties of officers exist in the Department, appointed in quite different manners—viz.: Officers of (1) the Directing Staff; (2) the permanent executive establishment; and (3) Inspectors of Ordnance machinery.

The Directing Staff has an establishment of 117 officers, of whom one—the Principal Ordnance officer—ranks as a Major-General and has honorary rank as such, whilst the others range in rank from substantive colonels to lieutenants, and are, departmentally, divided into 1st, 2nd, 3rd, and 4th Class Ordnance officers. It is entirely recruited from officers of the combatant branches of the Regular Army.

The first step to be taken by an Army officer desirous of entering the Department is to send forward his name as an applicant for the Ordnance Course. The qualifications required are very similar to those needed by applicants for the Staff College, and will be found in full detail in the "King's Regulations." Briefly put, the candidate must be under 35 years of age, must have over five years' commissioned service, and must be in every respect, physical and mental, an exceptionally good officer.

Should his application be favourably considered, he now faces the ordeal of a competitive entrance examination.

The subjects for this examination are not very difficult, consisting chiefly of elementary mathematics, but the competition is keen, the advantages of the appointments open to those who have passed the course being now fully appreciated. The candidate, if successful, joins the Ordnance College at Woolwich, and spends a year there in the study of gunnery, *matériel*, store accounting, machinery, chemistry, metallurgy, electricity, and optics, which are all very practically taught. An examination is held at the end of the year,

and those passing it are honoured by the affix of the letter "o" to their names in the Army List, and are considered qualified for appointments in the Army Ordnance Department.

A selection from the most promising officers of each Ordnance Course is made, and they are invited to continue at the College for another year of study, during which a considerably more difficult curriculum—involving the higher mathematics—is pursued, and officers are encouraged to specialize in subjects which specially appeal to them. Those passing the final examination of this second year's course are entitled to the letters "p.a.c." after their names in the Army List, and, as a rule, to preferential consideration for appointments in the Army Ordnance Department, and the various inspection, experimental, and manufacturing branches which are administered by the Master-General of the Ordnance.

It will be seen that the foregoing system is calculated to provide a carefully selected body of officers, whose abilities, educational qualifications, and capacities for work have been well tested, from which choice can be made to fill vacancies in the rank of 4th Class Ordnance officer.

These vacancies are, just at present, not very numerous. In the higher ranks of the Department a somewhat serious block of promotion is temporarily caused by a group of officers serving under an early Royal Warrant, whose provisions practically compel them to remain in the Department until 60 years of age. Moreover, under the system which we will next proceed to explain, many officers have been allowed to join the Department in the lower ranks for permanent service therein.

An "o" or a "p.a.c." officer fortunate enough to receive an appointment joins the Department as a 4th Class Ordnance officer, with his combatant Army rank, whatever that may be. He is appointed for four years, during the first of which he is considered to be on probation. At the expiration of the four years he can apply to have his appointment continued, with a view of being permanently transferred to the Department. Such transfers are only admissible after a total service in the Department, and in certain branches administered by the Master-General of the Ordnance, of seven years in the case of "o" officers and six years in the case of "p.a.c." officers (who, it will be remembered, have spent an additional year in the Ordnance College). Full details may be found in the Royal Warrant for Pay and Promotion.

It will be seen at once that the foregoing system enables a most careful selection to be made of officers for permanent service with the Department, and those so finally selected have every reason to be proud of the position they have gained by their efforts. Also, that a Department so officered should be a most efficient branch of the British Army.

The only manner in which—in the opinion of the present writer, at least—the system could be improved, would be the extension of the Ordnance College so that (1) Ordnance officers before joining their stations might be thoroughly educated in the technical work of the Department, and (2) might from time to time have the opportunity of attending “ refresher ” courses, and making themselves thoroughly acquainted with the latest patterns of Ordnance *matériel*. At present too much is left to be picked up by the newly-joined officer in the course of his daily work, and he may serve for years at such a station as Aldershot, where no experience of heavy ordnance and their stores is available, or at Malta or Gibraltar, where cavalry equipment of all sorts is conspicuous by its absence. It is earnestly hoped that funds may some day be available for more thorough technical education of the sort mentioned. It is a pity to spoil so good a ship for want of the proverbial “ ha’porth of tar.”

Some officers have had the opportunity of passing the “ Economics ” course in the London School of Economics—a most valuable privilege, which we would like to see more generally extended. The subjects taught are extremely interesting and useful to Ordnance officers.

The permanent executive establishment consists of 85 officers, with honorary rank varying from major to lieutenant, and departmental titles of Commissary, Deputy Commissary, and Assistant Commissary of Ordnance. They are appointed generally under the conditions applicable to quartermasters, from the warrant officers of the Army Ordnance Corps. All have, therefore, before receiving their commissions, had thorough practical experience of Ordnance work.

The establishment of Inspectors of Ordnance machinery numbers 22. They have honorary rank from major to lieutenant, and their departmental titles are Chief Inspectors, and Inspectors, 1st, 2nd, and 3rd Class. They are appointed by open competition, must be good mechanical engineers, and pass through a course of instruction in the Ordnance College after appointment.

The administration of the Army Ordnance Corps is vested in the Director of Equipment and Ordnance Stores at the War Office, under the direction of the Quartermaster-General. Under his orders the Officer Commanding Army Ordnance Corps, stationed at the Red Barracks, Woolwich, generally a lieutenant-colonel, performs the duties of a commanding officer at headquarters of the Corps.

The Corps consists of (1) 355 armament artificers; (2) 381 armourers; and (3) 94 warrant officers and 1,538 non-commissioned officers and privates.

The armament artificers are a body of skilled artificers who work under the Inspectors of Ordnance machinery. Their chief duty, in peace time, is the keeping of artillery armaments of all sorts up to date and in efficient working order. They are divided into two

branches—the range finding and the fitters, and are recruited from technically qualified civilian artificers and serving soldiers. The Commandant of the Ordnance College is responsible for their recruiting and testing.

A candidate for armament artificer (range finder) must have worked as a watchmaker or instrument maker in a Government establishment or under a private firm, be a thoroughly competent tradesman, and possess a knowledge of metal turning and of mechanical drawing. His qualifications are tested by the Chief Inspector of Range Finding. On the day of his attestation he is promoted at once to the rank of armament staff sergeant, and is then posted to the Ordnance College for duty till required to proceed to an out-station.

The candidate for armament artificer (fitter) must have worked as a fitter in a Government establishment or under a private firm, and must be a thoroughly competent tradesman. He must have a knowledge of metal turning and mechanical drawing, and, preferably also of electricity, steam, and applied mechanics. He is tested in his trade qualifications by the Superintendent of the Royal Carriage Department; and, if successful, he is put through a course of training lasting nine months. Having satisfactorily passed this course, he is enlisted, given at once the rank of armament staff sergeant, and then put through certain other technical courses before being posted to a district. Armament artificers can rise to the rank of warrant officer. They must be exceptionally good men to attain it.

Armourers are recruited from trained workmen serving in the Royal Small Arms Factory at Enfield, qualified serving soldiers, and boys specially enlisted into the Army Ordnance Corps and trained at Enfield. On enlistment they are granted the rank of armourer staff sergeant (boys only obtain this rank when 20 years of age), they pass through courses of instruction in the Royal Small Arms Factory and the Ordnance College (one month's course in bicycle repairs). Armourers can attain warrant rank. The establishments of armament artificers and of armourers include Indian requirements.

The store section of the Army Ordnance Corps is recruited from civilians of various trades and by transfers of suitably qualified serving soldiers. Enlistment and training are under the immediate supervision of the Officer Commanding the Corps at Woolwich, and a certain proportion of non-commissioned officers and men are specially trained in laboratory work by the Ordnance College.

The warrant officers of the store section are called Conductors and Sub-Conductors (somewhat old-fashioned titles dating from the days of convoys). About two-thirds of the appointments to the rank are made from non-commissioned officers of the Army Ordnance Corps, and the remainder from specially qualified non-commissioned officers of other corps. It will be remembered that

these warrant officers form the source of supply for the officers of the permanent executive establishment.

An extremely elaborate system of confidential reports exists, whereby every non-commissioned officer and man of the Army Ordnance Corps is reported upon as regards character, ability, and trade qualification, half-yearly. This enables the Officer Commanding the Corps to make an intelligent selection for promotion and extension of service.

We have now, we trust, convinced our readers that in the Army Ordnance Department and Corps, as at present constituted, we have a well-trained and efficient instrument for dealing with the duties entrusted to it. We will proceed to give some idea how these duties are performed in peace and war.

In peace time the first question arising is—What stores and in what quantity shall be provided during the coming financial year? The Priced Vocabulary of Stores contains about 1,500 pages of designations of stores—say 75,000 items, we have not attempted to count them! This does not include clothing. We have to provide for a due supply of all these, and not an excessive one, for funds are chronically scarce and patterns change so rapidly that, if we accumulate stocks, we may find ourselves laid up with some acres of useless and unsaleable articles hanging up in the storehouses.

We need not consider special services such as re-armament of artillery or infantry. Those have to be treated on their merits and decided upon by the Army Council.

It is found in practice that average annual issues form a very reliable guide to requirements, if proper care be taken to allow for exceptional variations. Woolwich, Weedon (for small arms and their components), and Pimlico (for clothing) therefore prepare estimates, founded on the above basis, for the stores considered necessary for up-keep of the Army during the coming year. Probably the value of these stores will amount to somewhere about £2,500,000 sterling. The estimates are of course revised and criticised at the War Office before being inserted in the Army Estimates, which, in due course, are voted by the House of Commons.

The next step is the placing of contracts for supply of such stores as it is not proposed to make in Ordnance factories. This is chiefly carried out by the Director of Contracts at the War Office. It is not quite so simple a matter as might be supposed, a great many points having to be considered which would not at once occur to the reader. But into this matter we have no space to enter.

Contracts having been placed and supplies commencing to come in, it is evident that (1) the supplies must be carefully inspected, (2) they must be distributed to the localities where they are wanted, and not allowed to accumulate at Woolwich, Weedon, and Pimlico, where storage room is strictly limited.

Inspection of purchased stores is a duty the importance of which cannot be exaggerated. The manufacturer, who has generally taken his contract on terms only moderately remunerative, has a strong interest in making as much profit as he can, by sending in articles which are just a shade inferior to the sample to which he has tendered. Let us suppose that the article is a soldier's box. The sample box has no knots in the wood of which it is composed. The manufacturer tenders a box with one small knot in it and pleads that the flaw is absolutely immaterial; so it is, but if the flaw be passed, there will inevitably follow more boxes with further "immaterial" defects, until the article supplied is decidedly inferior to that tendered for. The only safe method is that adopted. Sealed patterns are kept at the various inspection offices of all articles supplied by contract, and not the slightest deviation from them, either in pattern or material, is allowed.

Small arms, machine guns, and bicycles are inspected by the Chief Inspector of Small Arms; guns, carriages, steel, and all explosives by the Chief Inspector, Woolwich; Royal Engineer stores by the Inspector of Royal Engineer Stores. All the above officers are under the Master-General of the Ordnance and do not belong to the Army Ordnance Department. Clothing is inspected by the Chief Inspecting Officer at Pimlico; and practically all other stores by the Chief Inspector of Equipment and Stores at the Royal Dockyard, Woolwich.

The result of the care exercised in inspection is that an article passed into the service is, generally speaking, much superior to anything obtainable at the same price from outside sources. The writer, did the Regulations permit, would unhesitatingly supply himself and his household, on repayment, from Government stores at Vocabulary rates with any article held there in preference to buying in the open market.

Such stores as are not purchased by contract from the trade are made either in the Ordnance factories (under the Master-General of the Ordnance) or, in the case of clothing, in the Royal Army Clothing Factory at Pimlico. The latter establishment, with the storehouses adjoining it, is known as the Royal Army Clothing Department, Pimlico, and forms a compact combination of manufacture, inspection, and storage under the same roof. Its head is a senior officer of the Army Ordnance Department known as the Chief Ordnance Officer, Pimlico. A certain amount of clothing is obtained from the trade.

The principal store of small arms is at Weedon, under the Chief Ordnance Officer, Weedon.

At Woolwich, all Ordnance stores are held by the Deputy Director of Ordnance Stores, who is generally the Principal Ordnance officer.

We now come to the distribution of the stores when supplied and inspected.

At the headquarters of each command and district at home and

abroad (exclusive of India) there is stationed an officer of the Department, known as Assistant Director of Ordnance Stores, or as Chief Ordnance Officer, as the case may be, and forming a member of the technical staff of the officer commanding. Under his orders there will be one or more Ordnance dépôts, generally located at seaports or localities with good railway facilities. These dépôts form the immediate source of supply for the troops in the command or district, and the Assistant Director of Ordnance Stores, or Chief Ordnance Officer, is responsible for holding in his storehouses such quantities of stores as will enable him on any sudden mobilization to meet the defensive requirements of the areas allotted to the dépôt for supply, and generally to meet the needs of the troops, keeping some six months' stock in hand, and accumulating no large surpluses of stores. He will also probably have to see to the keeping up of certain special war reserves, of which more anon.

To enable this to be done, each Ordnance officer in charge of a dépôt prepares once a year an Army Form known as an "Annual Demand." This is a most elaborate document, in which the name of every store held at the dépôt must appear, and has 24 columns allotted to it for the purpose of recording information as to the exact state of its stock and the probable needs for it. The basis of the document is the average annual issue of each article during the past three years. We need not here go into details, and will only say that the "Annual Demand" form, in its present condition, is the result of many generations of Ordnance experience, and that it enables a man possessed of no initiative and little power of reasoning to arrive, by an almost purely mechanical process, at a very fairly accurate conclusion as to whether the stock of stores at his dépôt is sufficient or not for his requirements, or surplus to them.

These "Annual Demands" are forwarded to Woolwich (or Weedon, as the case may be), and supply is made upon them as stores are received from inspection. No very large stocks are kept at Woolwich, for reasons already given.

At some of the large Ordnance dépôts, storehouses for clothing have been built, to decentralize the supply. Where such storage exists, clothing for the troops is locally dealt with in very much the same way as Woolwich stores.

We have now—provided everything has worked smoothly (and, as the poet says: "Alas! how easily things go wrong!—Alas, how hardly will things go right!")—stocked our Ordnance dépôt. The Department must now see to it that the stores are properly cared for and periodically counted and checked to make theft impossible; that they are issued only in accordance with regulation; that full value is got out of them by the troops, and any damage or loss not clearly chargeable to the public is paid for; that they are well and economically repaired, when worth repairing, and finally, when worn

out, that they are disposed of to the best advantage, by sale or otherwise.

To describe, in detail, the methods whereby the above and the other multifarious duties of the Department in peace time are carried out would entail the expansion of this article beyond reasonable limits. We can only attempt to convey some ideas on the subject to our readers by depicting the life of an Ordnance depôt as we should see it, did we enter it on any ordinary working day.

After passing the gates of the enclosure—where our business therein would be strictly enquired into—we should find ourselves in an open yard surrounded by storehouses and workshops. There would probably be a large stone building, the lower story of which would be occupied by long rows of vehicles. This would be the mobilization store where the equipment and vehicles for war units not existent in peace, and the war reserves, are kept. We shall again refer to these when we treat upon the war duties of the Department, and they need not detain us now.

Various transport wagons accompanied by small detachments of soldiers will be standing at the doors of the storehouses. These are troops drawing stores previously demanded, of the readiness for issue of which they have received notification. At the camp equipment store men of the Army Ordnance Corps and civilian employes are loading up wagons with tents, camp kettles and such like, for a "week-end" Territorial Camp. A court of inquiry into various cases of loss and damage is sitting in the Ordnance office, and several non-commissioned officers and men are waiting to give evidence. In one corner of the yard men are tearing up blankets, smashing ironwork with hammers, and apparently ruthlessly destroying articles of all sorts. They are dealing with condemned stores no longer fit for service, which it is intended to sell by auction. Were they to be disposed of intact they would probably sooner or later find their way back to the Department, and be again exchanged for serviceable articles, under the ingenious system familiar to those who have read that very amusing book, "The Green Curve." So they are in process of conversion to "produce" rags, iron, wood, tin, zinc, &c.

In the storehouses the officer on duty is "taking stock." He counts a certain number of articles each day, the particular items to be checked being notified weekly by the Chief Ordnance Officer. The whole of the stores at the station must be verified at least once in three years. Every separate description of store has a "tally board" hung upon it containing an exact statement of receipts and issues, kept strictly up to date. At any time the board may be taken down and balanced, and the balance compared with the stock.

If these agree reference can be made to the ledger office, to which no foreman or storeholder has access. Should stock, tally board, and ledger coincide, it may fairly be concluded that everything is correct.

Some quartermasters of units have called to know why they have not received stores for which they have indented, and the reasons for delay are being explained to them. The failure of a contractor to supply to Woolwich, or the wholesale rejection of the supplies made by him as not coming up to the sealed pattern, would be the most frequent cause, but as to this the depôt will only know that Woolwich has stated "due from contract," and can only pass on that information.

The Chief Ordnance Officer is struggling with a mass of correspondence, and trying to draft, in spare intervals, a time table for the issue of stores required for the Defence Scheme on mobilization. Some of the clerks are wrestling with the preparation of the "Annual Demand," others are checking indents by the Equipment Regulations, writing-up ledgers, hunting for old "War Office authorities," registering letters, and performing the other multifarious duties of an Ordnance office. Many of them have perforce been detailed during the past summer for detachments with large standing camps in the area, and there is a lot of back work to make up.

The officer detailed as Inspecting Ordnance Officer is at the laboratory, rigging up an apparatus for the "silvered vessel test" of a quantity of cordite. Presently, he and his laboratory foreman (a man of the Army Ordnance Corps who has passed a course in laboratory work at the Ordnance College) will have to register the readings of a thermometer by day and night, at frequent intervals, and will have almost as lively a time as the first officer of a steamship at sea.

The Inspector of Ordnance Machinery is in the workshops, whence there issues a busy hum of machinery, driven by a large oil engine. His machinery artificers are, for the most part, working in the small workshops of the outlying forts, or of the brigades of Horse and Field Artillery (to each of which a "fitter" artificer is attached). But a heavy job on the mounting of a 9·2-inch gun has had to be brought in to the central Ordnance workshop, to be tackled by the large lathe there, and the Inspector of Ordnance Machinery is not sorry of the opportunity to see generally how that workshop is getting on.

It is, as usual, vainly endeavouring to complete the work thrown upon it. Repairs to vehicles, construction of artillery targets, overhaul of typewriting machines, upholstering of officer's and mess furniture, mending of camp equipment, carrying out of alterations ordered by List of Changes in War Material, conversion of accoutrements, and innumerable other jobs. The existing staff—composed of tradesmen of the Army Ordnance Corps and a few civilian carpenters, tinsmiths, &c., would need doubling if all the "repair indents" coming in were to be dealt with in the workshops. The Inspector of Ordnance Machinery sighs as he turns over the pages of the indent book. He will have to ask the Chief Ordnance Officer to put out much of the work to be done by civilian contractors, and that means that

he will have to watch its performance as closely as the Chief Inspector of Equipment and Stores does that of original supply.

The armourers are busy in their shop, browning a number of rifles for a corps unprovided with its own armourer (most corps have one attached to them who still remains a member of the Army Ordnance Corps), and carrying out an alteration in pattern to the arms in general store and on mobilization charge.

As for the Assistant Director of Ordnance Stores his present whereabouts is unknown. The Chief Ordnance Officer has been unable to get him on the telephone, to ask him a conundrum. Probably the major-general in charge of administration has sent for him to confront the irate commanding officer of a Territorial brigade who cannot be brought to understand that, with the existing Army Ordnance establishment of the command, it is absolutely and obviously impossible to send a detachment to take over his camp on the ground.

For, up to the present, the starting of the Territorial Force has had the effect of adding very largely to the work of the Army Ordnance Department, both in the office and in the field, and, in some cases, has gone near to break the back of the willing horse.

We might enlarge much further on this theme of a day's ordinary work at an Ordnance dépôt, but space will not admit, so we will close this very imperfect sketch of peace work of the Department and turn to its war organization and duties.

The Department and Corps did good work in the many short wars and expeditions which followed its reorganization in 1881. But it was not thoroughly tested till it took part in the South African campaign.

When the war began, the Department—so far as it went—was efficient, but both in numbers, organization, and supplies of stores it was quite inadequate to the task before it. The personnel was far too small, and no means existed for augmenting it by any other methods than the employment of officers and men wholly ignorant of Ordnance work. Mobilization equipments existed for two Army Corps, a cavalry division and lines of communication troops; and reserves of clothing and necessaries for 25,000 men. Beyond these there were no reserves at all, there had been no calculations made of stores required for the up-keep of an army in the field, nor had any instructions been issued for the guidance of the Department in war time. The organization of the Corps was the peace one, of companies composed of a miscellaneous assortment of clerks and tradesmen, quite useless as units for war purposes. Accounting for stores in the field was supposed to be carried on on the same lines as in peace time, that is to say, the wretched Ordnance officer issuing stores was expected to obtain from the issuee a reference to the date and number

of the voucher whereby the stores were brought on charge in the latter's account ! The attempt to carry out this system under active service conditions in South Africa led to most lamentable waste of valuable time, and to more than one case of neurasthenia.

Fortunately for the Department, it possessed, at the time of the outbreak of war, exceptionally able officers at the all-important centres of Woolwich and Pimlico ; and the Director-General of Ordnance—who at that time administered its affairs at the War Office—was the well-known Sir Henry Brackenbury (now General the Right Honourable Sir H. Brackenbury, G.C.B., K.C.S.I.), whose equal as an officer and administrator the present writer has yet to meet. He at once faced the question of reserves—both for the immediate emergency and for the future ; and in April, 1900, the sum of £10,500,000 was voted to be spent in creating war reserves of all sorts and providing proper storage for them.

Meanwhile, the Principal Ordnance Officer at Woolwich, and the Chief Ordnance Officer, Pimlico, had compiled lists of what stores they considered necessary for the immediate up-keep of the Army, and these stores were sent out to South Africa. (Should any reader consider such lists a simple matter to undertake, let him try his hand at an item or two—say the probable requirements of an army of 150,000 men during the first three months of a campaign in boot laces and felling axes.)

The retired officers of the Department one and all offered their services, and were for the most part sent to home stations to take the place of serving officers detailed for the war. Men who had served in the Corps were similarly re-employed as civilians. But, to the very end of the war, the personnel of the Department was quite insufficient, and the work which fell upon both officers and men was so heavy that many broke down under it, and some never recovered from it.

The South African War is already an old story, and we need only say that—somehow or other—we kept the troops supplied, in spite of almost insuperable difficulties and by dint of ransacking the civilized world for supplies of certain stores, such as horseshoes and saddlery. Those who were behind the scenes, and knew what work was done, were filled with admiration for the manner in which the Department had wrestled with adverse circumstances and overthrown them, and were fully determined that—so far as it was possible to make provision beforehand—it should never have to wrestle with them again.

The Department and Corps has *now* a growing reserve both of officers and men which can be drawn upon in war time. It has a system of "Ordnance dépôt units" to which, although only formed in case of war, men of the Corps are told off in peace time, full lists being kept in each command showing the allotment of every individual

non-commissioned officer and man. The Ordnance dépôt unit represents the establishment (both store and workshop) required for a small advanced dépôt; is complete in itself; and is considered the smallest unit in which the Army Ordnance Corps can be organized for war. By taking multiples of the unit, an establishment in which the trades and callings are approximately proportionate to the work required can be obtained for larger dépôts.

The details of various workshops, standing and mobile, have been worked out, and will be found in the Ordnance Manual (War), which publication we commend to the careful attention of our readers. Its price is only 6d., and a study of its pages will show the work of the Department in war in very interesting detail. If the reader can realize that not a line of this Manual was in existence at the outbreak of the South African War, and that the officers of the Department had, under the pressure of actual need, to evolve all the organization and detail shown therein, he will realize what progress has been made.

We have now—thanks chiefly to Sir H. Brackenbury's £10,500,000—reserves sufficient to enable the whole of our Expeditionary Force to be despatched on active service complete in its equipment, and with sufficient stores for its up-keep until regular supplies could be obtained from the Government factories and the trade.

The whole of the Ordnance services in the field would be under an officer entitled the Director of Ordnance Services. He would have a difficult task to fulfil, but not nearly so difficult as it would have been 10 years ago. He would organize the whole working of the Department, whose duty in war is defined as "the provision, storage, and distribution of the following to the best advantage—arms, ammunition of all kinds, personal and camp equipment, vehicles, harness and saddlery, horseshoes, signalling stores, guns of all natures and their appurtenances, entrenching and other tools, barrack and hospital stores, bridging material, telegraph stores, miscellaneous stores, clothing and stationery," and the keeping of most of them in repair.

All this is carried out by a system of dépôts and workshops, large and small, immobile and mobile, which can be studied in detail in the Ordnance Manual (War). The old system of accounting for stores by units on active service has, thank Providence, been abolished, and an Ordnance officer will now be attached to the headquarters of each division who, besides performing other duties, found most necessary by the experiences of the South African War, will constitute a check upon extravagance and waste of stores. Of course, innumerable conundrums, for the solution of which no "precedent" exists, will turn up on active service as they do now under peace conditions, and the ultimate success of the departmental arrangements

will depend solely upon the men who carry them out ; but it is the opinion of this writer that neither Department or Corps will be found wanting (except possibly in numbers, which he would like to see largely increased) when the day of Armageddon arrives !

NOTE.—The writer desires to acknowledge his indebtedness to a lecture delivered by Colonel Mathew, C.B., D.S.O., at the Staff College, and to an historical sketch of the Army Ordnance Department and Corps published in the *Army Ordnance Corps Gazette*, both of which he has used freely in the compilation of this article.

XII.

THE LAND-SIDE DEFENCE OF DEFENDED PORTS.

By LIEUTENANT-COLONEL F. E. G. SKEY, C.R.E., Ceylon.

I DO not believe that much has been written on the subject of the defence of Defended Ports from the land side, and yet there is little doubt that if the fixed armament and the other coast defence works are in thoroughly efficient and up-to-date order, it is not from the sea, but from the land side that an attack, if such should ever occur, is to be expected.

It has been stated that this land-side defence is nothing but an ordinary operation of field warfare, but if this is true, it is only partially so, for there are many conditions which are peculiar to this kind of warfare, and I think it will be found when all these peculiar conditions are considered, that the ordinary methods of field warfare may require considerable modification to meet this special case.

The primary object of the defence of a Defended Port from the land side would appear to be to cover the rear of the coast defences. These would probably be the objective of a hostile land attack, on the principle that when they have fallen, the port and all that it contains will be at the mercy of the victors. But, on the other hand, the attack may be directed against some other objective, an objective which may supply the reason for which the port is fortified, *i.e.*, either docks or coal stores, or even the shipping in the harbour, and, consequently, as part of the scheme of defence, the land-side defences must cover not only the coast defence works but also every possible objective of a hostile attack.

At the same time, the separate coast defence works should each one be capable of individual defence. This is of course necessary as a protection against small landing parties or treacherous attacks from within our lines. But some of them should be prepared to offer a more vigorous resistance, and to form separate keeps or *réduits* to the main defences. Even one such work may be able to deny the use of the harbour to the enemy's ships, and, in the case of a colonial port, the existence of a single *pied-a-terre* may make all the difference in the task of recovering possession of the whole colony. These works are

not usually well adapted to defence on their land sides (the special conditions under which they are sited make such adaptation difficult to achieve), but they should nevertheless, every one, be prepared to give the best resistance possible, and some at least should be equipped with a view to a possible individual defence of several days.

It is an interesting question to discuss at what period the works of the land defence should be put in hand. One naturally thinks that if there is a period of warning and preparation before the outburst of hostilities, they should be carried out in that period. But yet, when one thinks of the number of Defended Ports in the British Empire, one trembles at the amount of destruction which will ensue when once the Royal Engineers are unloosed upon the peaceful inhabitants. Perhaps we should compromise and decide what should and what might not be done in this period ; but then most people would say that if we are fortunate enough to get such a period everything should be done in it. There is one probable solution, however, that there is very little chance of such a period ever occurring.

Now it is not intended in this paper to refer to fortresses which are defended on their land side by permanent works, though this makes but little difference, for such works, if they exist, can only form the skeleton or framework on which the defence works on this side will be based or developed. In the same way the attack is not contemplated to be undertaken under the conditions of regular siege operations, though up to a certain point such operations would differ little from those which we are considering.

The special preparations for defence must, therefore, commence with the erection of a line of provisional works to cover the land side not only of the coast defences but also of all the important contents of the Defended Port. This incidentally will entail the forceable taking over of a great quantity of lands and buildings, and it is to be hoped that the local authorities will place no difficulties in the way of the Engineers in their immediate occupation of all such localities. There will be no time for discussions and legal preliminaries, private houses and places of business must be cleared out at an hour's notice, and if there will be a more unpopular body of men in the Empire for the time being than the *sacré corps du génie*, it will be hard to find it.

We will now consider the nature of the probable attack and the conditions under which it will be carried out. We will assume that the attackers will come from oversea, and will obtain a landing on the coast within 20 or 30 miles of the Defended Port. The operation will be begun by night, but it cannot be long concealed, and it cannot be completed, unless the invading force is a very small one, or the conditions extraordinarily favourable, within a considerable number of hours. We may assume that the invaders are strong enough to deal with the probable number of defenders, and that their troops are picked men, though after their voyage they may not be in the best of

training. They will find the operation of landing a fatiguing one, they will be overloaded and overworked, and before long they will probably be underfed, and under these conditions even picked troops may not take long to get to the bottom of their powers of resistance in these degenerate days. Of course they must find no transport on the spot, and even their ammunition must be carefully husbanded if they move far from their base. In short, we may count on them as being not very mobile, but good fighters, urged forward by every inducement to press the affair and to bring it to a successful conclusion.

They can bring but few guns, and those not abundantly supplied with ammunition, but we must not forget that they will expect assistance from their covering fleet, though the latter will hardly want to waste their ammunition, and will always have to reckon with the guns of the coast defences.

There is no doubt that the invaders must be harassed from the start, and that riflemen mounted on motors or cycles or on horse-back must hang about them continuously. The more marching and counter-marching, the greater the expenditure of ammunition and energy which can be imposed on their covering detachments, the better. They must be given no rest, and must be made to lose confidence in themselves from the very beginning.

Turning once more to the defenders, we have already seen that at a certain distance from the Port a strong defensive line must be erected as soon as possible after it has been decided that war with a foreign naval power is inevitable. In considering the nature of this line we are confronted with the fact that some ports differ considerably from others in the extent of their land fronts. Some are very short, and these lend themselves comparatively easily to defence. Others are very long, and consequently difficult to cover with a small garrison. In this latter case the line of works might be a composite one, containing two distinct classes of works, those intended to contain a permanent garrison from the beginning, and those prepared in readiness to be occupied by the troops of the active defence, or others, under certain contingencies. The first of these two classes would consist, in the light of modern ideas, of a row of fortified groups or pivots, with wide intervening spaces left open for the free manœuvring of the troops allotted to the active defence. The second, which would be slightly drawn back in the intervals, would consist of smaller works, mutually supporting one another, and perhaps in some cases sited in chequerwise order, to cover effectually the gaps without obstructing them. It is impossible to lay down any hard-and-fast rule which will suit all cases, but we may take it for granted that there will be only one line, and that its ends, where they approach the coast, will rest on groups of works, of the nature of fortified pivots, which will tend to drive the enemy's attack inland and separate him from the support of his covering fleet.

It would be unwise to lay down any definite rules for the nature of the works, as they must depend chiefly on local conditions, but those near the coast must be heavily traversed and well concealed from all open water that is out of reach of the guns of the defence, while inland there would not be the usual objection to the occupation of walls and stoutly constructed buildings. A staple pattern of work might be the blockhouse, as being peculiarly adapted to economising men and to covering important bridges and defiles, but it should always be surrounded with a low parapet which might extend, within the obstacle, slightly to the flanks, in case the enemy succeeded in bringing a gun or two into action. If the defence has mobile artillery and machine guns, a generous supply of alternative emplacements might be prepared for use when the guns are no longer required with the mobile force. In most places, too, a great deal of work will be necessary in improving communications; roads and bridges will have to be made or improved, and screens will no doubt be required to conceal our movements of troops from the enemy. So much for the provisional works, and we must not forget that each separate coast battery must be fortified and equipped to resist an independent assault, and that one at least should be prepared to act as a keep to the defences.

The personnel of the defence divide themselves into various groups. We have already mentioned the relays of scouts or skirmishers who will have to hang on to the enemy and worry him continuously, and who would probably be detached from the troops reserved for active defence. These last are formed into a small force of all arms who are standing ready to move out and fight the enemy. The action of these troops is not easy to define, as each case will depend on the local and actual conditions. We can hardly count on having at our disposal very large numbers, and our troops may not always be of the best material, and, therefore, if we are likely to be out-numbered, the force must not advance far beyond the neighbourhood of the land-side defences, for, if they are cut off or badly defeated beyond the reach of support, the result may be fatal to the safety of the place. It is also to our advantage to draw the enemy as far as possible from his transports and from the covering support of his fleet. At the same time a weak defending force, by manœuvring in conjunction with one or two of the fortified pivots, and possibly supported by the fire of a gun or two of the coast defences, might work out some very pretty tactical problems, and might lead even a strong body of assailants into considerable difficulties. The conditions would, of course, be entirely changed if the defending force is large in comparison with their opponents. Here they would have no reason to surrender the initiative, and could attack boldly in hopes of finding the enemy not yet fully prepared to receive them.

The next group are the garrisons of the defence pivots, who will, of course, never leave them without orders under any conditions of good

or evil fortune. After this, if the Commandant can spare himself the luxury of a reserve, he must certainly do so, though he must not unduly weaken his active force, or for the matter of that, his passive defence garrisons either. Last, but far from least, there remain for the defence of the batteries themselves the men of the garrison artillery and engineers, who, having their specialist duties to attend to, would hardly be available in the earlier stages to join in the land-side defence, and these can, of course, count on being largely reinforced by the remnants of all the other groups of the defenders.

In a garrison of this description it is impossible to count on having at disposal troops of uniformly equal excellence, and probably there will always be included a large proportion of irregulars. In addition to these, it is to be expected that, on the outbreak of war, the Head-quarter Offices will be besieged by men who are too busy in ordinary life to join auxiliary corps, but who would not wish to be idle in case of attack, and for these there must be a good reserve of rifles and practice ammunition, so that the garrison will consist of all kinds of troops, including, one hopes, a nucleus of really good regular infantry. If it can be so arranged, no portion of the work of defence should be left entirely in the hands of unreliable troops, and the various corps should be mixed, some of each taking part in each group of the active and passive defence. This emphasises the importance of camaraderie and good feeling between all the corps who are associated together in a garrison of this description, and, parenthetically, one hopes that the difficulties of the builders of Babel will not be repeated in any of our very mixed garrisons.

Now, all things considered, one would suppose that if the garrison of the Defended Port has any time to make ready, that is, if the attack does not arrive at a moment of profound peace, and before any special preparations have been begun, the task of the defence, even against considerable odds, should be a fairly easy one. And yet it is a curious fact that this is not borne out by history. If we study the records of attacks from the land side upon Defended Ports in the past, whether in the old wars of the eighteenth and early nineteenth centuries, or in the modern wars of the last few decades, we are bound to confess that in the majority of cases the attack has obtained an easy and often a seemingly quite undeserved success. It is interesting to enquire into the causes which have led to such results. The first cause must undoubtedly be the element of surprise, which attends the arrival of every oversea expedition, and will almost certainly find something unready even in the best-regulated of garrisons. Another cause may be the influence of the crowded civil population, suddenly confronted with the horrors of war, and hardly disposed to offer ready help to the soldiers who have hitherto been working quietly in their midst. The passive tactics of the defence have been to blame in an immense number of cases, but, when one reads of the extremely feeble resistance

which has been so often offered in the defence of places of this description, one is bound to lay the blame largely upon the troops and upon their officers.

The defence must not be content with a single fight, even though it may be a good one, and even though they be confronted with enormous odds. They must keep up the resistance with the utmost obstinacy to the last ditch. Every hour's delay adds to the chances of relief and to the difficulties of the attackers. No partial success on the part of the latter should be allowed for a moment to weaken the resistance of the garrison. Many an attack has succeeded when upon the point of being abandoned in despair, and it is want of grit on the part of the defenders which is the chief danger to the safety of the Port. This want of grit must be eradicated by every effort possible in peace training. It should be impressed upon the defenders that they are better off in every way than their opponents ; in a friendly country, supported by defences, and supplied with everything needful, while the invaders are overworked and probably starving, and, if well hunted, will give way under the strain in the course of a very few days, or even hours.

XIII.

THE NEGATIVE ANGLE SYSTEM OF SIGHTING.

By MAJOR F. BYRNE, The Connaught Rangers, Superintendent,
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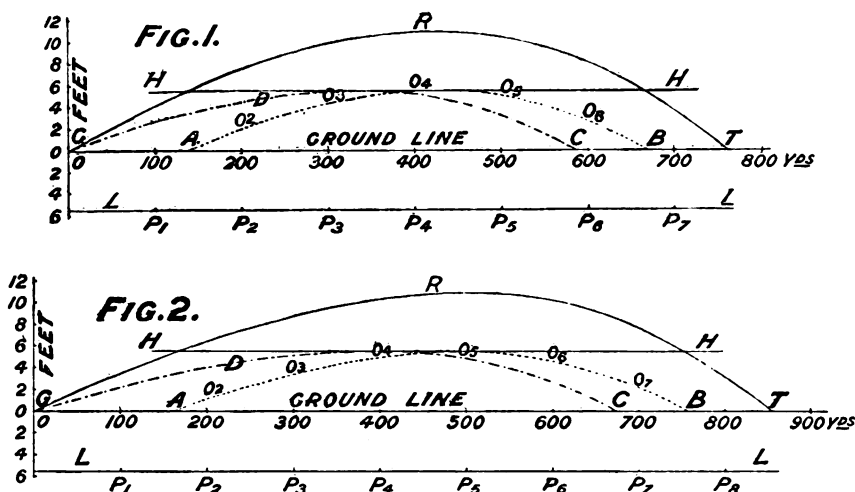
IN January this year, Sir George Greenhill delivered a lecture at the Institution of Electrical Engineers in which he introduced a new system of sighting for Small Arms and Artillery which has been discovered by Mr. Ommundsen. Much has been written in the public Press concerning this discovery, and, as the question is one of great and general interest to the Services, it is proposed in the present article to enter into a description of the principle, and to investigate the result of applying the system to our Service rifle with our Service ammunitions.

Put as simply as possible, the principle of Mr. Ommundsen's system of sighting is as follows :—

A range is selected at which the normal trajectory has a culminating point twice as high as the normal height of the target. Thus, if the object to be fired at is a man 5' 6" high, the trajectory selected is that whose culminating point is 11' above the ground line, while for a target of 1' 6" normal height, a trajectory with a 3' vertex is taken. The elevation for the range in question is then put on the backsight and remains unaltered for any distance at which the target may be, within certain limits. If aim be taken at the ground line irrespective of the distance of the target, it is obvious that, for a great part of the range, the bullet will fly harmlessly above the target, and that the dangerous spaces are only comparatively small distances at the beginning and end of the respective ranges. In order to increase the dangerous space, and, at the same time, reduce the safety zone, Mr. Ommundsen proposes the seemingly simple plan of always aiming a certain fixed depth below the target whatever may be the distance of the target from the firer within, of course, the said limits. This depth he has taken to be the same as the normal height of the target for the particular trajectory selected. Thus, in the 11' trajectory, the normal height of the target being 5' 6", he decides that aim must always be taken 5' 6" below the target's feet. The practical result of applying this system is always to lower the trajectory at the point where the target is situated by approximately the target's height,

and, therefore, to bring the bullet's flight down to such a level that the larger portion of the range is converted from safety into dangerous space.

The principle is, perhaps, best understood by reference to diagrams, and Figures 1 and 2 have been prepared to illustrate the application of the system to our present Service rifle and ammunitions. Figure 1 is for Mark VI, and Figure 2 for Mark VII, the new, ammunition; the target selected being a man on foot. In each case the height of a man is taken as 5' 6" in preference to the more modern tactical standard of 5' 3", so as to agree with the assumption made by Sir George Greenhill in his lecture. For the same reason, the rifle is taken to be fired from the ground line instead of 1' above it, as is usual in Text Books.



The figures may be explained as follows, the same lettering being applicable to both :—

G T is the range at which the trajectory has a culminating point or vertex 11' high. For Mark VI it is 760 yards with a backsight elevation of 45' 5", and for Mark VII 855 yards with elevation of 45'.

G R T is the normal trajectory over these ranges, the rifle being fired from, and aim being taken at, the ground line.

H H is a line drawn 5' 6" above the ground line.

L L " " " below " "

Now, if aim be taken at the ground line, it is clear that the dangerous spaces are from G to A and from B to T, distances of : for Mark VI, $137 + 98 = 235$ yards, and for Mark VII, $165 + 104 = 269$ yards, leaving safety zones A to B of 525 and 586 yards respectively.

Suppose, however, that with the same backsight elevation, aim had been taken, not at the ground line but at a point 5' 6" below it; that is to say, that if the target were 200 yards away, suppose aim

were taken at P_2 , if 300 yards away at P_3 , and so on. The result will be to bring the trajectory down by approximately 5' 6", so that, with the target 200 yards distant, the bullet will pass through O_2 ; if the target were 300 yards away, it will pass through O_3 , and so on. This can be more easily understood by making a tracing of the trajectory G R T and, pivoting it on the point G, swinging it down until the ground line or line of sight G T on the tracing intersects the line L L. By marking several points such as $O_2, O_3 \dots O_5$, &c., the curve $O_2, O_3 \dots O_5$ is traced, and this curve describes what Sir George Greenhill terms the "path of hits."

It may now be convenient to examine more exactly the effect of always aiming a certain fixed distance below the target. First, it means that as the target approaches the firer, the angle of depression of the line of sight increases at a regular rate, as given by the formula

$$\tan \theta = \frac{T}{3R} \text{ when } \theta = \text{the angle of depression of the line of sight,}$$

T = the height of the selected target in feet, and R = the range in yards. Since the tangent elevation (*i.e.*, the backsight elevation on the rifle) remains the same throughout, the result of this varying angle of depression is that we get an angle of quadrant elevation or depression (*i.e.*, elevation or depression with reference to the horizontal) which constantly varies according to the distance of the target from the firer. The amount this quadrant angle, for a particular distance of target, differs from the known elevation that is required to obtain correct impact at that range, gives by simple calculation the amount that impact is "up" or "down" at that range with reference to the ground line. By plotting these various points of impact the curve $O_2, O_3 \dots O_5$ is produced.

The actual figures of the calculation are interesting and are shown below in tabular form. Angles are taken correct to the nearest half-minute.

1	2	3	4	5	6	7
Distance of target from firer.	Elevation for range G T	Depression of line of sight due to aiming 5' 6" down.	Quadrant elevation or depression from 2 and 3.	Correct elevation for range in 1.	Error in elevation from 4 and 5.	Error in impact due to 6.
<i>Mark VI.</i>						
Yards.	'	'	'	'	'	Feet.
100	45.5	63.0	-17.5	-2.5	-15.0	-1.3
200	45.5	31.5	+14.0	+2.0	+12.0	+2.1
300	45.5	21.0	+24.5	+7.5	+17.0	+4.5
400	45.5	16.0	+29.5	+14.0	+15.5	+5.4
500	45.5	12.5	+33.0	+21.5	+11.5	+5.0
600	45.5	10.5	+35.0	+30.0	+5.0	+2.6
700	45.5	9.0	+36.5	+39.5	-3.0	-1.8
800	45.5	8.0	+37.5	+50.0	-12.5	-8.7

1	2	3	4	5	6	7
Distance of target from firer.	Elevation for range G T	Depression of line of sight due to aiming 5' 6" down.	Quadrant elevation or depression from 2 and 3.	Correct elevation for range in 1.	Error in elevation from 4 and 5.	Error in impact due to 6.
Yards.	'	Mark VII.		'	'	Feet.
100	45° 0'	63° 0'	-18° 0'	+ 5° 5'	-23° 5'	-2° 0'
200	45° 0'	31° 5'	+13° 5'	+ 8° 0'	+ 5° 5'	+1° 1'
300	45° 0'	21° 0'	+24° 0'	+11° 5'	+12° 5'	+3° 3'
400	45° 0'	16° 0'	+29° 0'	+15° 5'	+13° 5'	+4° 7'
500	45° 0'	12° 5'	+32° 5'	+20° 0'	+12° 5'	+5° 4'
600	45° 0'	10° 5'	+34° 5'	+26° 0'	+ 8° 5'	+4° 4'
700	45° 0'	9° 0'	+36° 0'	+32° 5'	+ 3° 5'	+2° 1'
800	45° 0'	8° 0'	+37° 0'	+40° 5'	- 3° 5'	-2° 4'

The result of the employment of this system may now be examined, and it will be seen that, for the elevations in question and with the rifle fired from the ground line, what was formerly safety zone has now become dangerous space, and *vice versa*, or, in other words, that the dangerous space for Mark VI ammunition at 760 yards range has increased from 235 yards to 525 yards, and that for Mark VII at 855 yards range from 269 yards to 586 yards.

This, then, is the principle of Mr. Ommundsen's system of sighting as explained by Sir George Greenhill, and if the large audience who attended the lecture received its introduction with enthusiasm, they cannot, in the absence of adverse criticism and discussion, be blamed for it. On the face of it, it would seem that Mr. Ommundsen had happened on one of those simple discoveries which, once they are found out and explained, make people wonder why they had remained hidden so long.

No one who has had experience of the errors made by the soldier in judging distance on active service will feel inclined to belittle any suggestion which will tend to diminish the possibility of these errors, and, were it not for the faults which will now be discussed, Mr. Ommundsen's discovery would be valuable. It will be shown, however, that the objections to employment of the negative angle system are much greater than the advantages to be gained by it, and it will also be shown that there is a simpler and more accurate means of achieving a better result, and that is the use of a battlesight of the ordinary type.

The chief advantage claimed for the negative angle system of sighting is that it does away with all necessity for judging distance or range-finding once the target has come to within a certain range. Under the conditions taken as the basis of investigation this claim holds good, and it has been shown, in addition, that, under the same conditions, it increases the dangerous space by more than 100 per

cent. But, in order to establish his claim, Mr. Ommundsen proposes that the soldier will always aim the normal target's height below the target; that is to say, for an erect figure he will aim 5' 6" down at whatever distance the target may be within range G B. This sounds delightfully simple—all the soldier has to do is to imagine that his target is 5' 6" high, judge that distance below, and take aim. But suppose the target crouches so as to assume a height of 4' instead of 5' 6", will not the natural tendency of the soldier be to aim 4' down rather than 5' 6"? Most assuredly it will, and the result of such an error, if maintained, will be to raise the "path of hits" by 1' 6", thereby extending the dangerous space at either end but leaving a corresponding amount of safety zone at middle range. Similarly, if the firer consistently aims 6' 6" below the target instead of 5' 6", the "path of hits" will be lowered by 1', with a resultant loss of dangerous space. To put it generally, any error in judgment of height has an exactly corresponding effect on the position of the points O_2 , O_3 , &c., and it is easily seen that a small mistake in under-estimating height, particularly at middle ranges, may seriously affect accuracy. It will, of course, be urged that similar mistakes with the ordinary sight will produce equally serious results. So they will, if they are made, but the chance of making them, when aim is taken at such a definite point as the target's feet, is infinitely less than when the line of sight has to be directed to an imaginary point 5' 6" below the target.

One more point before leaving the criticism of the negative angle system: a reference to the diagrams will show that the space G A is to all intents and purposes dead ground, since, if the negative angle system is rigidly adhered to when the target has got to a point nearer than A, the bullet must strike the ground between the firer and the target. The space G A varies with the "path of hits," as discussed above, but, under ordinary circumstances, there would always be a considerable stretch of dead ground immediately in front of the firer. Accepting the possibility, in fact the certainty, that firing at such short ranges will still be a feature of modern warfare, the negative angle system, to be successful, means the provision of a backsight which will be adjustable to a different elevation when the target comes to short range. As this adjustment would have to be made at an extremely critical moment, it is not unreasonable to say that any system which required it would meet with no favour in the eyes of those responsible for the tactical training of our troops.

During the course of his lecture, Sir George Greenhill referred to a modification of Mr. Ommundsen's system which, it was understood, was claimed to be a backsight automatically applying Mr. Ommundsen's system to the rifle. His reference to this point was scanty, but the idea appears to have been that the backsight should be inverted, and that the target should be seen, not over both back

and fore sights, but between them. The backsight was supposed to be placed midway between the eye and the foresight, and was to be of such a height that by "framing" the target between the inverted backsight and the tip of the foresight, aim was automatically directed to a point the target's height below the target's feet.

While accepting the fact that the inverted backsight will embody the negative angle system in practical form, it is clear that in doing so it must reproduce all its faults. There is but little need, therefore, to discuss the objectionable features of the proposed application of Mr. Ommundsen's system.

A comparison may now be made between the negative angle system of sighting and the ordinary battlesight. The latter may be taken as being a backsight of a fixed elevation, such that the normal trajectory of the bullet fired with this elevation will not rise above a certain specified height. In this article, for purposes of comparison, this fixed height is taken at 5' 6". In Figures 1 and 2 this trajectory is shown by the chain-dotted line G D C, this being the trajectory for 585 yards range for Mark VI, and for 675 yards range for Mark VII ammunition. It will be readily seen that the dangerous space extends over the whole of these ranges, viz. : 585 and 675 yards respectively. Compare these with the dangerous spaces as given by the negative angle system, viz. : 525 and 586 yards, and it is at once obvious that the advantage lies with the ordinary type of battlesight. Further, when we examine the effect of using the ordinary sight against an individual target with the rifle fired from any ordinary height up to 5' 6" above the ground, we find that, by aiming at the foot of the target, we have for ages past unconsciously made use of the negative angle system. When the rifle is fired from a height of 5' 6", we actually reap the full benefit of Mr. Ommundsen's discovery without suffering any of the disadvantages that have been discussed.

But it is against an extended target—that is to say, a target of some depth—that the superiority of the ordinary sight becomes really apparent. With aim taken at the ground line the whole of the battlesight range is bullet swept, whereas, with the negative angle system, the amount varies with the position of the target at which it is decided to aim. Thus, referring to the table of calculations given above, if the negative angle system is employed at a target 200 yards away, we find from column 4 that the quadrant angles of elevation are 14.0' for Mark VI and 13.5' for Mark VII; from column 5 we see that these are the correct elevations for 400 and 350 yards respectively, and the bullet, therefore, will strike the ground at these points. Similarly, if the target is 300 yards away these distances will be found to be about 550 and 560 yards. As the range to the target increases, so do these distances, but on the other hand the bullet will rise more than 5' 6" over a correspondingly increasing

portion of the middle range. One example is sufficient: Suppose the target aimed at is 600 yards away and Mark VII ammunition is used—the bullet will strike the ground at about 730 yards from the firer, but from 260 to 570 yards it will be over 5' 6" above the ground. At anything except an individual target, therefore, the negative angle system, far from increasing dangerous space, actually reduces it.

To sum up: It may be said that, under favourable conditions and against an individual target, the negative angle system of sighting extends the ranging power of the rifle with a fixed sight by a certain extent, but, even under these favourable conditions, the rifle is useless at short ranges unless a means is provided for further adjustment of the backsight. If, however, these favourable conditions are departed from, or if the soldier makes an error in estimation of height, the system at once breaks down. The mere fact of expecting the soldier to judge height correctly at an unknown distance, and in the heat of battle, introduces a source of error which makes the negative angle system unworkable.

It has always been a bothersome matter to teach men to aim at the ground line, but the difficulty would be increased many times if we had to teach them to aim the target's height down, and if we had, at the same time, to explain to them that, if the target were kneeling, they would have to imagine it standing.

XIV.

FIRE DISCIPLINE.

By COLONEL F. ST. D. SKINNER, Commandant, Central School of
Musketry, Pachmarhi.

“**B**ATTLES are won mainly by the accurate fire of individuals at decisive range.” This statement no longer appears in our Infantry Training, but, if we attach limitations to the word “accurate,” its justice may be inferred from the events of recent wars, particularly those in South Africa and Manchuria, though at first sight the contrary might appear to be proved.

While admitting that control should be maintained to the last moment possible, its advantages being obvious, we must not disregard evidence which shows that in the later stages of the fire fight control is often an impossibility, and that, where it can be asserted at all, its influence may not extend beyond the opening and closing of bursts of fire, and only survive mainly through the force of example, the men following where their leader initiates a rush, or holding their ground because he does so. In such case, every shot fired will be directed by the individual, and whether he fires steadily or wildly, loads or fails to load, keeps cool or loses his head, will depend on the nature of his training in fire discipline.

What is conveyed by the words “decisive range?” If we disregard the effect of enfilade fire, the latter half of the late war offers no instances of a determined defender being driven from his position by fire from such ranges as 500 yards. Where the Japanese were allowed to advance from a final fire position at such range it was because the Russians had abandoned their position for other than local reasons. Our Field Service Regulations indicate clearly the opinion that the fight for superiority of fire will involve a succession of advances to close quarters, where the distance to the defenders is so short that the latter will not have time to develop sufficient fire to defeat the assault when it is made. It may be that at times the attack, say, will establish a distinct superiority of fire at 500 or even 600 yards, but this will not be decisive; the assault could never be carried through from such a distance against a determined enemy, nor, at such range as this, may we expect to produce that demoralization

in the defender which will, as indicated in Field Service Regulations, lead to a decision by the mere advance to the assault. To make the assault a possibility, or a walk-over, we must push the fire fight to close quarters. Decisive range, then, we may fix as at something much nearer the position than 500 yards.

A lesson from the late war is that the bayonet will generally have to be used to induce the defender to quit his position, but a successful assault, where the defender has not been beaten in the contest for superiority of fire, is more or less unthinkable. How then, stands the almost exclusive claim of fire to the victory? A statement of the comparative losses inflicted by bullet and bayonet in Manchuria (85 per cent. and $2\frac{1}{2}$ per cent. respectively) shows that the preponderating share of victory is gained by fire. The moral effect of the bayonet is well known and need not be laboured, but equally terrible is that of an accurate fire at close range, as witness Ingogo, Majuba, and Nicholson's Nek. Where men have been exposed to fire for hours the desire to "get it over" will often lead them to the assault. There will be compensation in getting to close quarters, which will make up for the danger of the last rush. A higher, a more disciplined form of courage is requisite to enable infantry to endure a superior fire at decisive range, and fight on with determination. The bayonet is the emblem of victory, it is fire that earns it. The cult of the bayonet is wholly admirable provided a due sense of proportion is observed, but we must not allow ourselves to be so carried away by its glamour as in any way to neglect training in the use of a weapon whose effect preponderates out of all proportion over that caused by the *arme blanche*.

We see, then, that it is fire that compels victory. As in Napoleon's time, fire is everything, the bayonet only an incident in the fight. Again, the fire fight will be decided at close range, where its effect can be made so intense that the side which has attained superiority may reduce its opponent to so much moral pulp, and the advance over the last hundred yards or so be, comparatively, child's play. Finally, at decisive range control will be gone, and the individual will have to fight "on his own."

Fire discipline is the basis of fire control, but independently of this it is, as we have seen, the deciding factor in the fire fight, and, therefore, the most important branch of musketry training. There is a very plausible theory that on the battlefield rifle fire is more or less evenly distributed between the firing line and a line marking the extreme range of the rifle. During the attack on a certain position near Mukden, the fire of the Russian infantry (on the defensive) is said to have been extraordinarily wild, covering the ground impartially from the firing line to as far as 3,000 yards from the position, and causing comparatively small loss. Another theory (Wolozkoï's) does not send the bullets quite so far afield, but places the elevation

of the mass of the rifles at from $1\frac{1}{2}$ to $6\frac{1}{2}$ degrees, producing a beaten zone extending from 1,000 to 2,200 yards from the firers. Captain Eames, in the "Rifle in War," quotes to show that in 1870, once the long range zone had been crossed, the men were little exposed, because the fire passed too high. Speaking of the Russo-Japanese War, one who had served throughout it comments on the great falling off in the effect of rifle fire at 150 metres or less, and says: "No harm at all was done here, owing to nerves." These theories are inconsistent with our conception of fire discipline. That they can be supported by evidence shows merely that on the occasions referred to the fire discipline was bad. Such a wild dispersion of fire could not have taken place if the definition of fire discipline given in Infantry Training had been even fairly realized.

Is it in reason to expect that in action anything approaching the standard indicated can be attained? Whether or no, we should strive to make our fire discipline as perfect as possible. Are we on the right road to this end? Certainly not, if we are to judge from what can be seen at manoeuvres, where it is common enough to see men holding the rifle by the magazine, or with the left hand anywhere but at the point of balance, or firing without any aim whatever. It may be argued that such incidents do not fairly represent the standard of the battalion, but the fact that such things take place at all shows that the fire discipline of units tolerating them must be of the weakest. If fire discipline is to stand us in good stead in the fire fight, the training of the individual must be on lines embracing all essentials. The man must be made to feel that every time he fires his rifle, whether with ball, blank, or merely snapping, he is preparing himself for the fire fight. Before everything else the spirit of self-control is essential to fire discipline; without it, there can be no cool and intelligent use of the rifle, no careful adjustment of sights: nothing but a wild blazing away of ammunition. Why attempt the fostering of the individual's sense of determination on the rifle range if he is to be allowed to nullify the good work by ignoring at manoeuvres and field days all he has been taught? He must be made to feel that every time he fires his rifle carefully he is doing something towards strengthening his self-control under fire, that every time he "looses off" without having picked out a particular object to hit, carefully adjusted his sights, and fired with the determination to hit, he is only preparing himself to go to pieces at the first serious call of fire discipline in the fight.

Callwell tells us how marvellously the fire discipline of our men improved between the opening fight at Colenso and the final advance on Ladysmith. Doubtless, war is a very stern instructor. But why wait for war to teach us when we have ready to hand the means for preparing for war? Let us recognize that the drill sergeant has his limitations: he can cope satisfactorily

with muscle, but with brain to only a limited extent. Undoubtedly he lays the foundation of unquestioning, unreasoning obedience; and the constant repetition of certain practices, rapid loading, adjustment of sights, firing, and so on, ensures that these will be done automatically on service; what it cannot ensure is that the man will not go on firing after his magazine is empty, that he will adjust his sights carefully and fire to hit. The spirit of the man, his *moral*, must be got at. He must be taught the need of self-control and how to acquire it; must be made to feel that on him, just as much as on his company commander, rests the successful issue of the fire fight. A Prussian officer, describing his experiences at Wörth, tells us that immediately his company opened fire, all control and discipline vanished, everyone blazing away wildly. A corporal, one of the smartest and most intelligent men in the company, and on whom he greatly relied, was as bad as any. He tells us how he got hold of this corporal, shook him and brought him to his senses, and that thereafter he, the corporal, behaved like the good soldier that he really was. Now, why was it that of these two men, the captain and the corporal, the one behaved like a reasonable being, the other like one bereft of reason? Simply because the responsibility which the one by a lifelong training had been taught to accept steadied him, and because the other forgot his responsibility. Instead of training our men to lean on someone above them we should teach them to rely on themselves. The sense of responsibility must be developed to the utmost, "lest we forget."

The German official account of the Russo-Japanese War, in its criticism of the events of the Sha-Ho, says: "Frictions and difficulties disappeared in the enormous working of the Japanese army because everyone, from the highest commander down to the lowest coolie-soldier, was imbued with the feeling that he was responsible for the issue of the war." When our rank and file are imbued with this feeling, the fire discipline of our firing line will approach the standard set in Infantry Training. But, it may be asked, why, with this great point in their favour, was not the shooting of the Japanese better, for we have reason to believe that it was somewhat wild? Will is one thing, and skill is something very different. Now, the Japanese training in musketry was apparently very poor before the war, and to expect good shooting from poorly-trained men, no matter how excellent their spirit, is as if one were to look to a swordsman to do as good work with a blunt sword as with one keen of edge. Before we can expect our men to show a high standard of fire discipline under fire we must induce in the individual the sense of responsibility, self-control, and the determination to fight to a finish. How are we to do this? The drill-sergeant has begun the work, the officer must complete it. The drill-sergeant has taught the man to give ready attention to his leader's orders and signals, to keep

a sharp look-out for his enemy, how to adjust his sights, aim and fire carefully, and cease fire when the target disappears. All of these things he can be depended upon to do in time of peace, so long as he is under the eyes of his instructor. The body of our fire discipline is ready, its soul has to be awakened. This is the task of the officer, and a heavy responsibility it entails.

The character of the man has to be moulded, and that without any royal road to success. There can be no "Carry on colour-sergeant" here. Little by little the man must be drawn from his sense of irresponsibility till he feels in himself that he, as much as his officer, is responsible that all goes well. From his experiences, or from study, the officer must bring home to the man what the fire fight really means; not the few rounds that make heads bob during the preliminary advance, but the real business, when the cone of fire swishes past us as it used to do in the old days when we did duty at the butts, the aching terror that will unnerve the boldest and make all behave like lunatics if they are not on their guard and have a strong hold over their feelings; how they must control themselves if their fire is to do any good, and what the result will be if they once allow their feelings to get the better of them. But what good will all this do—very interesting to the men possibly—but what lasting effect will it have in the excitement of action? Anyone who has studied the subject knows the extraordinary extent to which one man may influence another by the power of suggestion, how long-formed habits can be overcome and a strong character built up by its influence, how a man can alter his whole character and disposition by auto-suggestion. A story of the Wilderness campaign, "The Red Badge of Courage," tells how a boy who had skulked during the first day's fighting sneaked back to a bivouac fire after dark. He had scratched his arm badly and his hand was covered with blood. Some men noticed this and talked of his pluck. The suggestion fired the lad and brought out all that was best in him, and next day, wherever the fight was thickest, he led the way. Of course, this was only a tale, but it was true to human nature, and it is human nature we have to deal with in our endeavours to make our fire discipline something real.

We must show our men what they have to face in the fire fight, how they have to exercise their self-control, to keep cool, to look for orders while orders can be given, and to act on their own initiative when control by leaders is no longer possible. It is of no use doing this once a year or so; the lesson then would be barren of result; it must be continuous. It is by constant affirmation that the will of one can be made the will of another. "But," the average officer will say, "what is the good of this to me? I cannot lecture." The difficulty is not in lecturing, or in saying what we want to say, but in knowing what

to say. The officer who knows (and the one who does not is out of place in the Army nowadays) will have no difficulty in making himself understood. We are too accustomed to looking on our men as dull and incapable of thinking. It is said that the more we develop the intelligence of the men in the ranks the better able they will be to appreciate the dangers they have to face, and the readier to shun them. If so, we must make them rise superior to their fears by developing their patriotism, *esprit de corps*, and spirit of self-sacrifice, self-control, and determination to destroy their enemy.

Since South Africa we have talked a great deal about developing the individuality and initiative of the men, but it has not got very much beyond talk. Now, our men are not difficult to teach. What is difficult is to undo work wrongly done. Where the men see that their officer knows what he is talking about, and is not merely reading to them out of a book, he commands their implicit confidence and can mould their wills as he pleases, and every word of his, good or bad, will go to form a character, in strength or in weakness, for the fire fight. Diffidence is our weak point, not lack of ability to show or teach. Appeals to our men are generally through *esprit de corps*, and limited to courage. Let us teach them that more than courage is necessary. Let it be a point of honour with them to do everything when by themselves just as if their officer were standing by them; then, when we see the men of a company "playing the game" at manoeuvres, firing to hit, and, all through the boring ennui of a long afternoon, always alert and ready for orders, we will know that not only have they been well drilled, but that the spirit they have acquired from their officers will stand them in good stead in the fire fight. Just as the continued repetition of certain practices ensures that they will be automatically performed in action, so will reiterated suggestion in training bear fruit in the day of trial.

Between the mechanical work of the drill-sergeant and the psychological task of the officer is an intermediate stage where, by certain exercises, both mind and body can be trained. On the range, the determination of the man can be fostered, and very careful training and watching are here necessary to ensure that every shot is fired to hit. It is essential that determination be developed here to the utmost, for at practices off the range the absence of the right spirit cannot be so readily detected as on the range. Before he leaves the range, then, the man should have developed a firm basis of determination. Off the range, by attaching to each field practice (individual) some simple problem, we can force the man to think for himself, and feel that he is responsible for his own actions, that he has to decide for himself whether he should fire or refrain from firing, use rapid or slow fire, to say nothing of such details as having to determine the range for himself.

Such practices may be divided into two classes : those developing quickness of eye, skill, judgment, and field-craft ; and those developing in addition nerve, coolness, and dependability. Into these latter must enter a certain amount of danger, the danger of being hit by one's comrades, for it is only through becoming accustomed to such danger that we can learn to face it unflinchingly ; and we cannot ensure immunity from such danger in war unless we train the individual man in peace how to use his rifle without danger to his comrades, and to face his responsibility in this respect. Such training can be given as where small squads practice mutual support, and again where, control being supposed to have lapsed, the advance is maintained through the determination of every man in the firing line to push on at all costs. Here individuals, as the spirit moves them, should creep or dash forward a few paces, three to five, the men to right and left of them being trained to the most careful handling of their rifles while keeping up a continuous fire in mutual support. Such practices would commence with snapping and blank, but must culminate in ball firing, for, if the danger is considered too great in time of peace, how great will it be in the excitement of action ! As a matter of fact, where training has been thorough, there is only just sufficient danger to foster determination and responsibility. It is lack of training that produces the danger. Until men have been trained to a cool and intelligent use of the rifle in circumstances involving some danger and excitement, what hope is there that when in action they will not fire so wildly as to make all advance impossible so long as fire lasts ? This is the supreme test, the work of the individual when " on his own." If the fire discipline of the battalion will stand this test we can rest assured that, when under control, its fire discipline will leave little to be desired.

Finally, we should follow the Regulations issued for our guidance, for every departure therefrom is a blow at discipline, and when laxity in such matters is winked at, and even condoned by officers, how great is their responsibility ! In some regiments the use of the fine sight is still taught, rifles are held with the left arm straight, or with the hand holding the magazine. These are only a few of departures from Musketry Regulations. Each of these practices is unsound in itself, but even if it were not, the spirit which permits of them is inimical to the spirit of fire discipline.

Much as we have advanced in training of late years, we are still to some extent influenced by fetish. At all costs we avoid mistakes in the march past, but play fast and loose with Musketry Regulations. Errors at ceremonial are patent to all, but only those trained will notice mistakes at mimic warfare. The spirit that takes advantage of this immunity from criticism is a weak link in the chain of responsibility.

A matter closely bound up with the application of fire discipline is

whether at close range deliberate aim is a possibility. Captain Eames, in the "Rifle in War," considers that careful training on the range will ensure such aim at 400 yards. The probability is that at short range, say, within 300 yards, the great majority of shots is fired with no aim at all, or fired immediately the rifle is brought to the shoulder ; to expect the coolness essential to careful aim is, under the circumstances, unreasonable ; to demand it, mere vanity. Let us accept the situation and train for it. If fire discipline is to influence the course of the combat, the conditions under which the latter will be conducted must be anticipated in training. Our men must be taught snapshooting, a thing of which at present they know nothing. The annual course has certain practices tending to quicken up aiming and firing, but which fall greatly short of the real thing, being merely introductory to it. For thirty-two years Majuba has stood out as an object-lesson to us, only to be ignored, or to be talked about and misunderstood. To hit a No. 3 figure target, exposed at 100 yards for one second : that is snapshooting. When a man can cope with these conditions he will have confidence in himself, and confidence is the first and last step to accuracy of aim at decisive range.

If the natural tendency of a man is to fire each shot with maximum haste at very short range, let us systematize the tendency, and by practice teach our men how still to direct their fire with at least a modicum of accuracy while indulging the all-powerful desire to fire hastily. Constant practice in levelling and firing the rifle with extreme rapidity at an object at short range will ensure, to some extent, an automatic accuracy under the most disturbing circumstances. To ignore human weakness and to train for carefully aimed fire in the final fire fight can lead to nothing but disappointment.

XV.

SOME NOTES ON MUSKETRY TRAINING.

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IT is intended in this article to discuss a few questions in connection with musketry training, and, at the same time, to put in a plea for directness and simplicity in this important subject.

It is not, however, proposed to refer to the question of machine-gun organization or training (as this may be well regarded as a subject apart), except to venture a prophecy that the next European war will prove the necessity of a large number of highly-trained machine-gun detachments, both organized independently, and also forming part of other units as at present.

Under the influence of a progressive School of Musketry, musketry training in all its branches and the standard of musketry knowledge and skill have advanced by leaps and bounds during the last ten or twelve years. Various aids to musketry training have been devised ; a higher standard of marksmanship, and one more in keeping with the requirements of war, has been set up ; and the principles which govern the scientific application of rifle fire have been disseminated amongst all ranks.

The time has now arrived when we should take careful stock of the situation, in order to avoid the dangers into which it is so easy to fall when a certain standard of excellence has been reached, viz., the dangers of elaboration and over-theory. We must remember that "*en guerre tout est simple*," and that our training too should be simple ; not only to fit us for the conditions which are likely to obtain in war, but because, whilst groping after the shadow, we may lose something of the substance ; whilst becoming more scientific we may become less practical ; and lastly, because the simpler and more direct the teaching, the better will be the results.

An officer or non-commissioned officer is keen, and feels, perhaps insensibly, that there is insufficient scope for his keenness in simple musketry teaching, in ensuring that every man under his command has acquired the skill and knowledge which is considered to be necessary. He, therefore, spends much time and thought in perfecting some appliance, or in devising some method, which he thinks

may be of value ; or he gives undue time and attention to some one of the recognized aids to musketry training, or to some special branch of that training which appeals to his scientific faculty, such as indirect or night fire ; and he fails, meanwhile, to note that he has more third-class shots than he used to have, or that his men understand less than they did the uses of fire, or the simple principles of fire tactics.

I need hardly refer here to the officer who was held at one time to be of great value to his regiment and to the Service, because he enabled his regiment to win the " Officers' Cup " of the A.R.A., or to have the best regimental team in his Command, at the expense both of the instruction and the ammunition of the rank and file. Such an officer is now almost extinct—his opportunities, at any rate, are limited ; although the existence in some regiments of a few " experts " and of a large number of second and third-class shots still testifies to his sometime baneful influence.

Saner methods, fortunately, prevail ; but the danger of elaboration and over-theory, especially in regard to barrack square training, is a very real one.

It is not suggested that every recognized aid to musketry training should not be made the fullest use of ; but we should be careful, in suggesting these aids and in making use of them, that they are really achieving the result which is required, and that they are only regarded as a means to an end, and not as the end itself of musketry efficiency.

At one time it was a common criticism that some unit was not employing all the devices suggested in the text books and at the School of Musketry for improving its musketry efficiency. Now it is not uncommon to see a regiment which neglects none of the methods prescribed by the Regulations, and which adds to these methods many of its own ; but yet to find that that regiment has a large number of indifferent shots, or that it has no appreciation whatever of the uses and application of fire.

We must, then, be continually on our guard to maintain simplicity ; and to keep the object in view, we must lay before ourselves certain definite aims and see that we attain to them.

Let us consider what these aims should be ? We have to see that every non-commissioned officer and man under our command :

- (1) Understands and takes care of his rifle.
- (2) Is able to shoot rapidly and accurately under varying conditions and at varying targets.
- (3) Is able to estimate distance, to pick up indistinct targets for himself, and to recognize them when described to him by others.
- (4) Understands the uses of fire, and is able to apply it both when acting independently and collectively.
- (5) Understands the use of ground and of cover.

Our non-commissioned officers must, in addition, understand :

- (a) How to teach.
- (b) How to issue orders for fire.
- (c) How to direct and control fire.
- (d) The principles of fire effect and vulnerability.

The above may be considered to be our chief aims, both as regards non-commissioned officers and men ; the rest of what they learn being only the means to these ends.¹

We next have to consider how these aims are to be achieved.

They are to be achieved by following the system laid down in our text books, by avoiding perfunctory teaching, over-theory and elaboration, and by adopting the simplest and most direct teaching that will attain the objects in view.

Musketry training appears to fall naturally under four heads :

- (I) Barrack-square training.
- (II) Range practices.
- (III) Field practices.
- (IV) Application of fire.

It may be well to consider under each of these heads a few common defects in our musketry training, due sometimes, in the opinion of the writer, to defects of equipment, sometimes to lack of directness or simplicity in our text books, but more often to the way the instructions contained in the text books are carried out.

Before, however, dealing with these heads, it is proposed to refer briefly to three questions of equipment.

The Rifle.—A change of rifle is a costly thing, but to us less so than to any other great Power, as we have a smaller army to equip, whilst we have a longer purse to draw on. We should, therefore, always possess the best rifle in Europe ; and although our supremacy in this respect must be often temporarily assailed, the earliest opportunity should be always taken to regain that supremacy.

Whilst considering this question of the rifle, it is desired to urge the advisability of the removal of the wind gauge and fine adjustment. The advisability of the removal of the fine adjustment is commonly admitted, so need not be argued here ; but that of the removal of the wind gauge is not so generally agreed upon. The advantages of the latter are more obvious ; *e.g.*, to facilitate the instruction of a recruit by enabling him to aim always at his target ; for use in siege warfare, whether in attack or defence, when time is available for deliberate and carefully calculated fire ; for the lateral dispersion of the cone of fire, &c. ; but, normally, the wind gauge will not be employed in war, and we run the risk of its faulty adjustment, or, what is more serious still, of losing the instinctive power of aiming off for

¹ No allusion has been made to such an important subject as range taking, as this is only learnt by a certain proportion of N.C.O's. and men.

wind, which comes from constant practice in peace. If the wind gauge must be retained, let us at any rate restrict its use to recruits, and to certain named practices of the trained soldier's course.

Range-finders.—Here again the argument of the small army and the long purse applies; but we have here to consider the question of the proportion, as well as the pattern, to be issued. There has, for example, been issued lately an up-to-date one-man range-finder; but there appears to be no immediate intention of removing the present disability of having only one range-finder for every two companies. The issue of one range-finder per company is more necessary with a one-man range-finder than with a mekometer, as more frequent opportunities will present themselves for its use.

It is well to consider these two questions, that of the rifle and of the range-finder, together, as a low trajectory and an exact knowledge of the range will alone enable us to benefit by accuracy of fire. The necessity or otherwise for accuracy of rifle fire will be referred to later.

Ball Ammunition.—Now that field practices are receiving each year more attention, and that the increased use of rapid fire has involved the expenditure in tactical exercises of more ammunition, it is hoped that the reduction of the ammunition allowance for cavalry and infantry from 300 to 250 rounds per man may be reconsidered. Field practices have been the principal sufferers by this reduction, the present allotment for individual field practices being 35 rounds in place of the former allotment of 50 rounds, and that for collective field practices being 50 rounds in place of 75. In carrying out practices involving "Fire and Movement" with a shortage of ammunition, we run the risk of inculcating false lessons with regard to the volume of fire to be employed.

In addition to an increased allowance of ball ammunition, it would be of great advantage if this ammunition might be issued, as blank ammunition now is, as a Command allowance, as this permits the transfer of ammunition from one unit to another; and also if unexpended balances might be carried over from one year to the next. Under the present system units usually preserve a proportion of their all too small allowance to provide for possible contingencies, with the result that, at the end of the year, they may either have a surplus which lapses, or they may be tempted to waste ammunition during the last three months of the year to avoid the assumption that the ammunition allowance is more than sufficient, or the criticism that they have not made the most of their opportunities.

(1) BARRACK-SQUARE TRAINING.

This training suffers much from the faults of perfunctory teaching, over-theory, and elaboration; and there is the greatest risk in this training and in field practices of losing sight of the object in view.

The commonest form of perfunctory teaching is an obvious lack of real interest on the part of the instructor, which allows the men's interest to flag, and often permits them to be taught over and over again what most at any rate of them already know. Whether it is a question of mechanical skill or musketry knowledge, we know what standard each man has reached ; and if we find that he has reached the desired standard in any subject, we must not weary him with further instruction in that subject ; it not only disgusts him, but deadens his intellect and makes him stale. It is a common failing to do this, and one to be avoided. It is not uncommon to hear a non-commissioned officer explaining in detail to a squad of trained men, many of whom are good shots, how to perform the motions of loading their rifles ! Could anything be more wearying and useless ? To avoid teaching certain men in a squad what they already know is not always very easy ; but if the trouble is taken to differentiate between those who know and those who do not know, much more interest is taken and better results are achieved.

Before leaving this question of barrack-square training it is desired to say one word on the subject of fire direction.

The necessity for efficient indication and recognition of targets is readily apparent, and has been insisted on for some time past, whilst various methods for ensuring it have been taught ; and yet it is impossible to test a squad of men in this subject without seeing how imperfect the results are. In one case the recognized methods of target description are not employed ; in another, the targets are well described, but are not " recognized " by the men ; and in a third case, one finds that recourse is had to an elaborate indication, by the clock and finger method, of a simple target which would be indicated more quickly, and with greater certainty, by anyone who was entirely ignorant of this method. Whilst neglecting no means of target description which may be of value in any particular case, we cannot insist too strongly on the employment, in every case, of the simplest method which the situation admits of.

(II) RANGE PRACTICES.

It is hardly necessary to insist that the improvement of bad shots, rather than the perfecting of good ones, is our object in these practices ; for this principle is now generally admitted and acted upon. We must be careful, however, to keep this constantly in view.

We must be careful, too, not to fuss and interfere with a man who shoots well, because we consider that he has developed a defective style ; provided, that the defect carries with it no military disadvantage ; *e.g.*, an inaptitude for snapshooting or rapid fire, an exposure of the body whilst firing, or some unnecessary movement which is likely to attract the attention of the enemy. Our energies can be much more usefully employed than in doing this.

(III) FIELD PRACTICES.

It is curious that these practices, which are the first attempt to apply our musketry knowledge and skill to service conditions, appear to stimulate the interest of the average officer and man less than either of the forms of musketry training already referred to. They are, perhaps, more important and less well carried out, speaking generally, than any other branch of musketry training. They do not consist, as they once did, of a few long-range volleys at targets stuck into the sand! On paper, the schemes are usually progressive, well drawn up, and calculated to teach the lessons desired.

Then why this frequent lack of interest and falling off in the execution?

It might be thought that our restricted field practice areas and the limitations imposed by the presence of real bullets were considered to make these practices unreal and, therefore, uninteresting. There is no doubt that these restrictions do very seriously limit the exercises which can be usefully performed on a field practice range; but curiously enough, when a half battalion or battalion scheme is attempted, abundant interest is usually shown, and these schemes are often well carried out, so far as the limitations referred to above permit. It is in individual field practices, in exercises for sections, half companies, and companies, and in tests of fire effect and vulnerability, that the lack of real interest and real instruction is so often apparent.

With regard to tests of fire effect, &c., a tendency has been noticed for some units to spend too much time over these at the expense of field practices proper. A careful selection should be made of tests which require practical demonstration in order to be of any value, and great care should be always taken to sustain the interest of the onlookers, while such tests are being carried out. In some cases, as, for instance, in tests of the comparative vulnerability of different formations, where there is less necessity for practical demonstration, and where true results can be only obtained by firing thousands of rounds, it might, perhaps, be best for regimental officers and men to acquire their information from tables drawn up by the Staff at Hythe and included in the text books.

But as regards field practices generally, what is the reason why so little interest is often taken in carrying them out? The reason is that many company officers have less appreciation of what is required than in the case of range practices or barrack-square training. There are less definite results; unless company commanders are really keen, and have set themselves a standard to be reached by the whole company by means of systematic and progressive training; unless they are constantly inspired themselves, and contrive to inspire others, with a real desire to reach this standard, the work will be perfunctory, and, consequently, uninteresting.

The writer has heard an officer defending a practice, which had little or no military value, by saying : “ *We must amuse the men.*” If company officers are keen, they will readily interest the men—it is not necessary to make field practices artificial or unreal to do this ; and, if the men are interested, we can afford to dispense with the necessity for amusing them ! An element of competition, too, may be often introduced without destroying in the slightest degree the military value of an exercise.

It is right that we should leave this instruction, as we leave range practices and barrack-square training, to company officers ; but the instruction given at present in different companies, and even in different battalions, is so uneven, as to indicate the necessity for increased supervision.

The above applies equally to the cavalry as to the infantry ; but it should be insisted that, for the execution of collective field practices by cavalry, only field practice areas, whether rifle or artillery, should be utilized which admit of the use of the horses, and of the correct application of dismounted fire. This principle is recognized in Ireland, where the Glen Imaal artillery practice area is used for this purpose.

(IV) THE APPLICATION OF FIRE.

It is scarcely necessary to insist on the necessity for accuracy of fire, as the theory that it is useless to set a high standard of accuracy of fire, which has so many adherents on the Continent, has few influential supporters in this country. This theory, as is well known, is based on four propositions :

- (1) That we shall never be able to teach the majority of our men to shoot accurately.
- (2) That even if we could teach them to do so in peace, they would not do so in war.
- (3) That if it were possible to ensure accurate shooting in war, ignorance of the range, and consequent inaccuracy of sighting, would render good shooting a positive disadvantage.
- (4) That it is often an advantage to have a widely dispersed cone of fire.

Taking these arguments in detail :

Our experience has shown that every man, unless he has some physical defect, can be made to shoot reasonably well. We admit a considerable falling off in all shooting in war ; but we contend that even in the stress of battle a good shot will remain relatively better than a bad one, and that opportunities will often occur when he will fire as well, or nearly as well, as in peace. We admit the arguments stated in (3) and (4), but contend that the remedy for (3) is a relatively flat trajectory and the utilization of every appliance and of every method for obtaining the correct range ; and that as regards (4), it is

better to employ combined sights or other means of artificially dispersing our cone of fire when occasion demands it.

The advantages of good shooting need not be stated, as they are more obvious; but it is well to insist that the power of accurate shooting begets confidence, and that confidence is a valuable asset in war.

As regards rapidity of fire: We have, within the past few years, acquired a proficiency in rapid firing, combined with a reasonable accuracy, which no Continental army can approach. It is proposed to refer later to this question of rapid fire; but it may be said here that troops which are able to deliver well-controlled bursts of rapid and accurate fire must derive a great advantage in war.

Having touched on these two questions of accuracy and rapidity of fire, let us now consider certain aspects of training in the application of fire.

It becomes more than ever necessary in this phase of our musketry training to be as simple and as definite as possible. We require what Colonel McMahon, the late Chief Instructor at Hythe, has described as "tabloid tactics," or what may be termed a "doctrine of rifle fire," which can be easily and simply taught to the men.

A strategical or tactical doctrine may be thought, by some, to be not only unnecessary, but harmful; unnecessary, because the commanders who are affected are qualified by education, training, and experience to apply general principles to situations as they arise, or to conform to action taken on such principles by their superiors; harmful, because initiative is hampered, and opportunity may be lost, whilst advantage may be given to an enemy by his knowing what course of action to expect.

With questions of rifle fire the matter is different. Here we may have junior non-commissioned officers, and even private soldiers (when acting independently), called upon to determine when fire should be opened, and if so, in what volume. In any case non-commissioned officers will be usually called upon to decide the volume of fire, as this is one of the duties of a fire-unit commander, and the normal fire-unit is the section (Infantry Training, Section 123). We cannot, therefore, be too precise.

The ignorant use of fire, besides wasting ammunition, may be extremely prejudicial to the tactical situation. Whereas, if the uses of fire are clearly understood, and it is not made use of merely because the enemy is seen or his position located, it is more likely to be used, and in its proper volume, when occasion demands it.

Our text books give us the information which is required; but not, it is thought, in the form which is most easily assimilated by junior officers, non-commissioned officers, and men. That more is necessary is suggested by the continuation of pointless desultory fire, and the frequent absence of proper supporting fire; although so

much has been said and written, notably (in this country) by Major-General Monro, on this subject.

For instance, a table might be given of the "Chief Uses of Fire" in a normal engagement, as for example :

- (1) To assist movement.
- (2) To prevent or delay it.
- (3) To prepare for the assault or counter-attack (*i.e.*, the struggle for superiority of fire).
- (4) To annihilate :
 - (a) By assaulting or counter-attacking troops when pursuing an enemy with fire ;
 - (b) By troops which have cut off an enemy's retreat ; and
 - (c) In the case of exceptionally favourable targets presenting themselves.

A further table might be given of "Minor Uses of Fire," *e.g.* :

- (1) To brush aside skirmishers.
- (2) To oblige an enemy to disclose his position.
- (3) To obtain correct ranges.
- (4) To draw an enemy by fire.
- (5) To hold him to his ground.
- (6) To meet a cavalry attack.
- (7) To cover the withdrawal of other troops.
- (8) To give an alarm.
- (9) To pick off individuals ; and so on.

The above tables are not intended to be complete, nor is it even suggested that the uses of fire should be allocated to the particular classes in which they have been shown here. They are merely given to exemplify what is intended by the "tabloid" system of instruction ; and to suggest that tables of this nature, based on the teaching of the text books, would be of great assistance in bringing home to the junior ranks of the Army an appreciation of this important subject.

What we have to ensure is :

- (1) That fire is opened (and in its true volume) when it is required.
- (2) That it is withheld, when it is not required.

The former is necessarily the more important ; but the importance of the latter is also very great, whilst its observance requires an appreciation of the uses of fire which will assist the observance of the former.

All ranks should be able to give an intelligent reason for opening fire ; and it must be clearly understood that the reason "that the enemy has been seen" is not, in itself, a sufficient one.

If this "tabloid" method of instruction is necessary with regard to the uses of fire, it is still more necessary with regard to its volume, because the decision as to volume will usually rest, as shown above, with a non-commissioned officer.

Infantry Training, after prescribing certain occasions for the use of rapid fire, says : " If rapid fire is continued for any length of time, it excites and exhausts the troops, and leads to waste of ammunition. Fire should, therefore, as a rule, be delivered deliberately . . . "

It is easy to understand the reason for this warning, because, in addition to the danger referred to above, there has been a tendency to make indiscriminate use of this new accomplishment of rapid firing on occasions which do not justify its use. But yet, if a comparative table is made of the ordinary occasions for the use of rapid and those for the use of deliberate fire, it will be found that the chief occasions when fire is employed, whether in attack or defence, will, in future, demand the employment of carefully controlled bursts of rapid fire.

Let us consider briefly what these occasions are :

It will be used in attack :

- (1) To assist movement.
- (2) To repel counter-attack.
- (3) To prepare for the assault (except in the case of a prolonged fire fight, unaccompanied by movement on either side).
- (4) To pursue an enemy with fire.

It will be used in defence :

- (1) When an attacking enemy exposes himself for brief intervals in his advance.
- (2) To cover the withdrawal of other troops.
- (3) To beat off an assaulting enemy.
- (4) To prepare for, or to support, a counter-attack.

It will also be used, both in attack and defence, in the case of exceptionally favourable targets presenting themselves ; whilst in dismounted cavalry attack or retirement, bursts of rapid fire are normally employed (Cavalry Training, Section 152).

Whether, therefore, rapid fire comes to be regarded, in future, as the normal fire or not, there is no doubt that its use will be very frequent. We must, accordingly, set ourselves to eliminate the dangers and difficulties which at present accompany that use.

First then, there is proposed for the use of the junior ranks a simple table showing the ordinary occasions for the use of rapid and those for the use of deliberate fire. This will prevent the indiscriminate use of rapid fire, and at the same time ensure its use on occasions which demand it. Next, we must improve our standard of accuracy combined with rapidity of fire ; we must perfect our fire direction and control ; and lastly, we must, at all costs, arrange for a sufficient ammunition supply. This last is admittedly one of the most difficult problems which confronts all armies. Let us with our superior wealth and our small Army be the first to solve it !

XVI.

AERONAUTICS IN FRANCE.¹

Report of the Chamber of Deputies Budget Commission (M. Clémentel, *rapporteur*) upon the Aeronautical Section, French Budget, 1912.
Published December, 1911.

Translated by CAPTAIN F. H. SYKES, 15th Hussars, General Staff.

AERONAUTICS.

THE reality, as regards aeronautics, is far in advance of the most optimistic forecast. The Government makes demands and Parliament at once votes credits, yet, even so, the development of aviation has been so rapid that its wants do not receive entire

¹ NOTE.—During the three months which have passed since this report was written, the French military authorities have made further progress in the development of their aeronautical services.

In the first place the Engineer Directorate at the War Office has been given a special aeronautical "bureau," and it is proposed to create shortly a Directorate for the "Fifth" Arm. Two new dirigibles have been added to the air fleet, and the number of aeroplanes has been increased from 174 (the figures mentioned by M. Clémentel) to 204. Moreover, the fortresses of Toul, Verdun, and Maubeuge are being equipped with aviation dépôts.

M. Millerand has recently introduced in the Chamber a bill for the organization of the aeronautical services, which are apparently to form in future an autonomous corps. The Minister, in the preamble of the bill, explains the future policy of the French War Office. He intends to ask Parliament to vote in 1912 about £960,000 for aviation and £320,000 for aerostation. It will be thus seen that the French are about to devote their attention principally to aviation. The dirigibles will not, however, be neglected, and it is proposed to have a fleet of 20 airships, and to maintain this number by replacing all obsolete dirigibles. By the end of the present year the French Army will be in possession of 334 aeroplanes. The unit will be the "escadrille," containing 8 machines divided into 3 active and 1 reserve section. Each section will be equipped with 2 motor trailers and 1 lorry, and each "escadrille" will have in addition 1 motor workshop and 1 motor car. The personnel of each "escadrille" will be 7 officer pilots, 1 administrative officer, 4 N.C.O's. and 44 rank and file, all of whom will be specialists, and 2 N.C.O's. and 14 rank and file, who will not be specialists. There will be an aeronautical regiment of 7 companies (4 balloon and 3 aviation) and 1 transport company. Some 30 aviation centres for instruction will be created.

GENERAL STAFF.

satisfaction. Our financial timidity is shown by the fact that, as regards aviation, supplementary estimates are the rule rather than the exception.

During 1911, though the tests of aviation were increased in number, there was no lessening in the bravery of our aviators. At Madrid, Rome, the Hague, Brussels, and in London, the French won everywhere, and the winners were received with enthusiasm.

The military service of aviation maintained itself on a level with the general development of the new locomotion, and, indeed, largely contributed to its progress. The period of hesitation is at an end, and the official introduction of this latest engine of war into military formations is now a fact. In June, 1911, a delegation of the aviation committee of the Senate and Chamber waited upon the Minister of War to request that means might be afforded to allow French aeronautics to develop as rapidly as possible. The Minister, having recognized the interest of the question, finished his answer as follows : " The War Office considers that aeroplanes and dirigibles are as indispensable to our national defence as are rifles and guns. Aviation is a military necessity."

The development of the fourth arm may best be shown by a statement of the successive credits which it has absorbed. The sums for dirigibles are not included ; for aviation alone a special credit of £9,600 was granted for first experiments at the end of 1909 ; at the end of 1910, £80,000 was voted ; for 1911, £204,800 was originally credited, but this sum is already (November) largely used up, and the Government has stated its intention of asking for a supplementary amount. The credits demanded for 1912 attain the sum of £304,000.

It was originally considered that aviation would be inexpensive, but this idea has proved erroneous. The life of machines and motors is short ; accidents are frequent ; the expenses of up-keep and of large repairs are considerable, as also of petrol, oil, &c. We should, therefore, entertain no doubt as to the fact that aviation will weigh more heavily upon our Budgets than we expected, and the burden will increase in proportion to the demands made upon the service. Parliament has not hesitated up till now to encourage noble and courageous effort, nor will it refuse the necessary credits in the future.

At present, we have a lead as regards other Powers which it will take them some time to catch up. But they are now seriously undertaking the task of aviation, and we must, therefore, be on our guard.

Germany has a military school of aviation at Doberitz where there are 50 attached officers ; a station has been established at Metz, and two others are projected at Thionville and Sarrebourg. A credit of 9,000,000 marks was allotted in the Budget for 1911. The machines used are the Wright, Albatros, Farman, Rumpler, Grade, Dornier, and Etrich.

Austria bought three machines a few months ago, and has arranged the conditions of a competition similar to that held at Rheims.

The Russian Army has a flourishing military school at Sebastopol which was opened in 1910 ; in May, she already had 23 officer pilots—12 of whom took part in the manoeuvres. The machines used are the Antoinette and Blériot, but a competition for Russian manufacturers was held in September.

The Italian Army has 15 officer pilots who use Blériot, Nieuport, Farman, and Etrich machines. Two amongst these were sent out to Tripoli, and have already effected valuable reconnaissances.

AVIATION.

Aeroplane pilots are recruited from the officers and men of all arms whose tastes and aptitudes attract them towards the service. They are not detailed. Candidates apply through the directors of their arms, and are appointed as required by the Permanent Inspector of Aeronautics. All arms furnish pilots, and the Inspector has had the happy idea of showing considerable eclecticism. Thus, at Chalons, the director of the central aviation school is Naval Lieutenant Hautefeuille ; at Douai, Lieutenant Ludemann of the Infantry ; at St. Cyr, it is Captain Etévé of the Engineers ; at Etampes, Captain Félix of the Colonial Infantry ; and at Biskra, Lieutenant De la Fargue of the Cavalry.

By spontaneous selection the fourth arm may be said to be an emanation of the courage and bravery of the others. At the formation of the new corps the pilots were detached from their own arms. But, so as not to create vacancies which would be prejudicial to the working of the various branches, the law of the 13th July, 1911, authorized the seconding of a certain number of officers (in accordance with a proportion to be determined annually by the financial law) and non-commissioned officers for the service of aeronautics.

For the present year this number has been fixed at 50 officers and 50 non-commissioned officers, a number which has also been stated in the provisions of the Budget for 1912.

Pilots receive first instruction in the military centres of aviation or in civil aerodromes. A perusal of the "*Marche de l'Instruction des Aviateurs Militaires*" will enable one to understand in what spirit and upon what basis the instruction of our corps of aviators is carried out. The author of this method is Colonel Hirschauer, under the direction of General Roques.

General principles as regards the choice of pilot pupils and the object of the training are given in the preface :

The driving of aeroplanes requires from pilots many moral qualities—courage, coolness, loyalty, and discipline. The habit of

sport and a knowledge of motors are qualities which, if not indispensable, are, at all events, of some value. The object to be attained is the training of pilots by means of complete and methodical instruction in order to give them a thorough knowledge of the medium in which they are called upon to work, confidence in themselves and in their machines, the ability to overcome any difficulties with which they may be confronted, the possibility of being able to look after their machines and motors, and, if necessary, even to make summary repairs, and the habit of observation both as regards the route to be followed and information to be gathered. The method is described as follows: The instruction should be carried on without hurry, and an endeavour made to confirm pupils in results gained before passing to fresh exercises. All hurry is harmful and generally causes eventual delay. No exercise across country should be attempted before the aviator has practised over the aerodrome. Height should only be attained gradually; pupils should practice *volplanés* over the aerodrome, at first from small, and then gradually increased heights. The instruction comprises four periods:

- (1) A preliminary stage of two to three months with the aeronautical troops, during which time the pilot pupils receive theoretical and practical instruction in aeronautics.
- (2) A period of detailed instruction given at a centre of military or civil aviation, having as its object the passing of the Aero Club tests.
- (3) Finishing instruction, given to those officers only who have shown particular aptitude during the first two periods. This is always carried out at a military centre, and should result in the pupils obtaining certificates as "military aviators."
- (4) Methodical training for long flights—manœuvres and war.

During the preliminary stage pupils receive full instruction in aeronautics generally, and practical instruction in aviation motors and machines. Also, in order to accustom them to the atmosphere and high altitudes, and to prepare them to land in open country, they are taken for a certain number of flights in free balloons, for which civilian institutions such as the Aero Club de France are ready to give help.

During the second period, officers under training at aviation schools learn to fly in biplanes or monoplanes. They choose the machine in which they wish to be instructed, and none of them has ever been forced to go up in any specified machine. At the end of this course, the pupils undergo the tests for the Aero Club certificate. At present, the number of officers who have obtained this certificate is 150. Since the 15th February, 1911, the difficulties of this certificate have been considerably increased in order to raise the standard of pilots.

To-day the candidate is required :

- (1) To effect two distance tests, each comprising a closed circuit of at least 5 kilometres without landing, of an interrupted circuit of figures of eight carried out by successive turns round two posts placed at 500 metres at most one from the other. The aviator is obliged to stop the motor when the machine touches the ground, and to pull up within 50 metres of a point designated by him before he starts the test.
- (2) A height test consisting of rising to a minimum height of 50 metres above the starting point. This may be combined with one of the first two above.

But the certificated pilot is still only an aerodrome aviator, and incapable of affording any help from a military point of view ; he must now undertake a series of longer and longer flights, and will train himself in the conditions of the tests for the "military certificate."

The tests of the latter are drawn up annually by the Permanent Inspector-General of Military Aeronautics who takes into account the progress of aviation.

For 1911, the candidate, being alone in the machine, had to effect three closed circuits at a greater height than 300 metres without landing, each circuit comprising a journey out and back between two points 50 kilometres apart, and the landing to be made at the point of departure.

The obtaining of this certificate should be the completion of a progressive and minutely regulated instruction during which the aviator gets to know his machine, and to recognize the difficulties inherent in the medium in which he has to work. The length of the training varies with the aptitude of the candidate. Having obtained the military certificate, an officer must still increase his knowledge by further training, which "La Marche de l'Instruction" defines as follows :—

Reconnaissance.—The pilot in reconnoitring should direct himself towards a stated point, cross a certain zone of country, and return to the point of departure. The zone to be reconnoitred is fixed by the director of the exercise, who, as far as possible, takes advantage of garrison manœuvres. A written report should always be supplied on the return.

Communications.—The director orders a pilot to go to a certain point. The pilot fulfils his mission in as short a time as possible after receiving the order. Having landed, he returns to the point of departure. The pilot must carefully observe the rules for avoiding being seen during the flight.

Sham fighting.—Pilots will receive orders to drop heavy objects (from gradually increased heights) on a piece of ground which has previously been carefully marked out ; they will be trained to follow

the line of a dirigible's shape marked out on the ground, and of which the length should be increased proportionally to the relative speeds of the machines ; they will fly above small captive balloons and kites, and over aeroplane skeletons being moved along Decauville railways.

We have 50 pilots actually ready to take the country, and 100 pupils. With civilian aviators called up as reservists, we have 100 pilots ready for mobilization. This figure is still less than our requirements, but it is constantly on the increase. We have a sufficient nucleus of officers capable of serving as instructors in flying, and those who aspire to enter the *corps d'élite* are still as numerous as ever. The list, however, of the brave men who have fallen this year is a very long one. But these catastrophes do not discourage anyone ; the survivors remain ready with absolute courage for the sacrifice. At the same time, however, while admiring this spirit, we must do everything possible to avoid or lessen accidents in the future. Heroism must be used as little as possible, and foolish daring checked. The director of an aviation centre, whilst allowing the aviators under his orders to show their bravery and initiative, must be able to hold them back from useless foolhardiness, and impose prudence. It is also possible that many accidents are due to imperfections in construction, and as far as these are concerned, Colonel Bouttieaux rightly proposes that a certificate of navigability, similar to the examination of ships by the Veritas Bureau, should be necessary.

We must not exaggerate the importance of navigation accidents, however, and if we have a tendency to pessimism, we shall be reassured a little by a glance at the statistics of accidents which occurred up to the 31st December, 1910. These statistics have been compiled by Colonel Bouttieaux for the Aviation Committee of the Aero Club.

There were 4 fatal accidents in 1909, and 28 in 1910 ; in 1908, 43 non-fatal ones occurred, and 70 in 1910. The number of accidents in 1910 was double that of 1909, but the machines built in 1910 totalled five times the figure of those in existence on the 31st December, 1909, and twenty times as many certificates were obtained in 1910. It is thus necessary not only to consider the mere increase in number of accidents, but also to take into consideration the augmented number of machines in use, of certificated pilots, and of distances covered. M. P. Rousseau estimates that up till the 31st December, 1910, 500,000 kilometres had been covered by aeroplanes ; this, taking the above-mentioned figure of 32 fatal accidents, gives a distance of 15,600 kilometres per death. That the risk of accident is still too high cannot be denied ; nevertheless, taking into consideration the growing numbers of aeroplanes in use, and the performances carried out, it is not increasing as fast as might be expected.

MILITARY TRAINING OF PILOTS.

We have studied the formation of our Corps of aviators; we have accompanied the future pilot during the course of individual instruction to the moment when he receives his certificate.

The pilot will maintain his skill by continuous training, but to know how to fly is not all. It would be a mistake to think that every man who can fly is able, without preparation, to carry out the rôle which falls to the lot of a military aviator.

The military problem consists in knowing how to find information and to make it known to the commander in the shortest time possible. To find a useful piece of information one must be able to read a map in full flight; know the three arms thoroughly; and be familiar with formations and able to follow movements. These points comprise an entire tactical education which must not be neglected. In certain well-placed military schools, such as those of Rheims and Chalons, it is possible for pilots to train themselves in the observation of important units, brigades and divisions, and to follow garrison manœuvres, but this, unfortunately, is not the rule. Thus, without curbing their keenness to carry out fine sporting feats, military aviators must also be encouraged to study their rôle in time of war. In order to multiply opportunities of practice in this direction, units were formed during the summer at the great camps of Mailly, Sissonne, and Chalons, so as to ensure practice in working together before the time of the autumn manœuvres.

In combination with the question of the military training of pilots there is, necessarily, that of observers. Two theories, both defended with equal conviction, are still found in the Army. Are observers necessary or unnecessary, and ought preference to be given to the single or to the multi-seater?

Technical reasons alone should not dominate this problem, and if, instead of pleading for such or such a machine, one looks solely to the result to be obtained, an opinion would not be a hesitating one; the observer is necessary in an aeroplane.

If some specially gifted pilots can drive in a strong wind, and, at the same time, know their exact position on the map, observe troops, and solve a sort of tactical problem every moment, the majority are still far from being able to acquit themselves sufficiently well under these difficult conditions.

We will add that experienced observers are necessary to allow of the use in the best circumstances of our large and brilliant group of civilian aviators, and to call on non-commissioned officers specially indicated by their previous profession or individual aptitude for the service of aviation.

It would seem that observers should be recruited from amongst staff officers specially good at reconnaissance, or, if none are available, from amongst specially gifted officers.

Their training will be performed in short courses at certain well-situated schools such as Chalons, Rheims, and Versailles.

Five or six staff officers have already received special training this year with officers of their own choosing, and teams so formed were particularly noticeable during the manœuvres, more especially during those of the 6th Corps.

The war aeroplane will, as a rule, carry two people: the pilot, whose training is of a technical character, and the observer, whose training is more tactical in nature. The object of the aeroplane is to observe, to see, and to obtain for the commander certain valuable notes. It is a machine at the disposal of the observer, and the pilot is merely its clever and daring driver. It is not sufficient to train the pilot; in the future, we must also devote our attention to the training of good observers. This was clearly understood by the correspondent of *Le Temps*, who accompanied a pilot at Chalons, transforming himself, as he put it, "into a pitiful packet carried in the storm."

The pilot alone, from a military point of view, is almost nothing; he is an air courier, merely useful in the same way as a postman. But the pilot and observer together are, perhaps, an element of victory for the staff. The public as yet, really, realizes nothing except as to the great feats of pilots, and it believed that aviation had progressed tremendously when Captain Bellenger flew to Pau, when Lieutenant Remy travelled by air from Chalons to Besançon without deviating more than 400 metres from his pre-arranged itinerary, and when Lieutenant Fequant, with the aid of a strong wind, covered the distance from Mourmelon to Rheims at a speed of 162 kilometres an hour. These accomplishments are interesting, but, in addition to the sporting value of such efforts, there is also the training proper for war to be thought of—the methodically and quietly followed military aspects of the case which are really by far the most important.

The best of staff officers cannot turn himself into an observer in a moment. During the first ascent he will be completely useless; the bravest are temporarily overpowered by giddiness owing to height, the roar of the motor, of the propeller, and of the wind. When all sense of discomfort has gone, the attention must be fixed on objects which pass all too rapidly before the eyes, and the observer must direct himself by the specially prepared map on which can be read at a glance the country over which he is flying. Experience alone allows one to recognize country from an aeroplane, and to grasp, for instance, that the object which looks like a grey crawling worm is a company of infantry in column. The observer must train his eyes and be able, if necessary, to supplement their shortcomings by photography. It will be seen, therefore, that much practice by the observer and pilot in collaboration is necessary.

We have shown how an officer becomes an aviator; more shortly

we will explain how he ceases to be one. The wings having been fledged, it remains to be seen how they close, if, alas, they are not broken by death. Detached or seconded officers are re-absorbed in their arms either at their own request or by order if their aptitudes are found to be insufficient, or in order to fulfil their regular periods of command. Aviators can, by the force of circumstances, only pass through the Corps of Aviation; aviation is not a career such as infantry or cavalry, where its course is followed until the time of retirement; it requires qualities of too special a character, and great energy and keenness. An aviator can hardly be expected to give more than four or five years of his life to active aviation.

ADVANTAGES RESERVED FOR PILOTS.

The special allowances at present granted to the personnel of military aviation were fixed by a decision dated the 10th August, 1911. The totals of these are as follows:—

Superior officers		2·50 frs. daily.
Subaltern „		1·50 „
Non-commissioned officers and skilled workmen		·75 „
Other non-commissioned officers serving beyond the regulation period		·40 „

These allowances seem niggardly in view of the amounts paid abroad. The following, for instance, is the system started in Russia:

An allowance of 532 francs per month, comprising a minimum of 6 hours' flight; 7/5 annual pay for each year, including 50 hours flying; an increase of 800 francs to all pensions of aviators who have completed three years' service of aviation; any aviator wounded as a result of a flight has the same terms on retirement as that received by a man wounded in war; and, if he dies, his widow has the right of a pension on a higher scale.

We shall see in this report that our allowances will be increased in 1912 to the rates of 8, 4, and 2 francs. Monsieur Messimy, like his regretted predecessor Monsieur Berteaux, has not economized the encouragements for our officer aviators and their comrades of the reserve; many have received accelerated promotion, and thirty-five have been enrolled on the list of the Legion of Honour. It would also be just to count every year passed in flying as active service from the point of view of pension on retirement. Compensating advantages should be offered to men who bring great intellectual, moral, and physical effort to bear, and face death daily.

We know the personnel required for aviation; it remains to consider the material resources placed at its disposal, *i.e.*, the practice areas and the machines.

Aviation centres.—There was only one centre of aviation at the (1594)

commencement of 1910, that of Chalons. Studies have since been undertaken with the object of finding the most suitable areas for the creation of new aerodromes. The expenses in respect of their organization are considerable, and it was the duty of the War Department not to neglect spontaneous help offered by towns and departments anxious to show their interest in aviation and in the services which it may be able to render to national defence.

The looking for grounds and the formalities of their acquisition ; the drawing up of plans and carrying them into effect ; the subsequent elaboration of the original schemes ; and the regulation of the financial part to be taken by towns and departments, all take considerable time.

Up till now, the results achieved are as follows :—

The acquisition has been undertaken of the necessary ground for the establishment of a centre of aviation at Betheney near Rheims. The Department of Cher has offered a subsidy of 300,000 francs for the aviation school of Avor (which is being made). The Department of Puy-de Dôme and the town Clermont-Ferrand have placed a similar sum at the disposal of the War Department. Pau has granted the State the free use of a large ground of 118 hectares in the Pont-Long area where a school will begin work next winter (1911-1912). And the aviation centre of Biskra will open at the same time.

The military authorities have also dealt with the organization of aviation in the military centres of the East.

But, whilst starting and carrying on the above work, it was also absolutely necessary to continue the training of pilots, and it is for this reason that the War Department decided to send its pupils to civilian aerodromes.

After these pupils have obtained Aero Club certificates, Government machines are placed at their disposal and kept in the existing sheds of aerodromes or in sheds constructed near them.

It is under such conditions that the centres of aviation at Douai (Breguet), Etampes and Pau (Blériot), St. Cyr (Paulhan), and Buc (Farman and REP), are organized. At Douai and St. Cyr there are also military workshops for carrying out summary repairs.

Certain criticisms have been made in regard to the complications which these establishments involve. Each of them is commanded by a chief, whose authority (independent of all questions of rank or seniority) is absolute in everything to do with technical instruction. The commanders of centres of aviation have only one chief—the colonel commanding the Sapeurs Aerostiers, the Director of the Dépôt of Aeronautical Material, with whom alone they correspond, whether as to staff (officers and men) or as to new material required for every-day use. The commander of an aviation centre draws up the roster of duties, allots the school machines, and arranges the teams ; he reports on the pupils, notes their progress, and guides

them with advice or gives orders ; finally, he administers the material and arranges for its upkeep and repair.

So as to allow him to devote himself as fully as possible to his chief duty—the training of pilots—his administrative work is reduced to a minimum compatible with the interests of the State.

Thus he is only required to fill up a monthly report form indicating shortly the state of training of the officers, their performances during the month, the state of material, and the requirements to complete it. In the case of accidents or serious breakage, the commanders of centres of aviation are held responsible (as in the case of all other corps or service commanders) for reporting by telegram to their chiefs and to the Minister. For repairs which are not carried out in the State workshop the commander draws up an estimate with a manufacturer, has the work done by the latter, and hands him a form taken from a book, with which he is furnished by the Director of Dépôts ; thus the aviator commander has no accounts or expenses to regulate.

It may be seen, therefore, that the administrative tasks of our heads of aviation are reduced to a minimum, and it cannot be said that they are sufficient to absorb all their activities ; they can still find time to aviate, and must not rest content merely with being good administrators ; indeed they are, or were, excellent aviators, such as Captains Etévé, de Chaunac, Félix, and Lieutenants Princeteau and Ludemann.

Besides the schools of aviation, there are the purely administrative establishments to which they are attached ; these are the aeronautic dépôts of Versailles, Chalons, and Rheims, which are common to the service of aerostation (balloons, dirigibles, and kites), aviation, and telephotography.

This arrangement has given rise to certain well-founded criticisms ; the dépôt for material manages the reserve, and assures the upkeep and maintenance of current material ; it thus relieves the school and seems necessary in this way, but it would be desirable that its organization should be supple enough to avoid any delay in the repair of machines, and in the delivery of current stores. In the centres where there are both a dépôt of material and a school, the head of the latter should be in command of both, so that small difficulties can be remedied which may result from double duties and authority. These criticisms have not escaped the notice of the Inspector-General of Aeronautics, and he has already taken measures to correct the faults to which they refer, especially at the Camp de Chalons.

It may here be noted that the French Government is the principal buyer of aeroplanes. Under these conditions, it would appear that the suppliers should understand that they owe it to themselves not to let foreign officers who may one day be at war with us even enter our civilian schools of aviation. Regrettable incidents have occurred

which it is hoped may not happen again, and require that, in case of necessity, the Minister shall introduce a clause to this effect into the buying agreement.

Machines.—The War Administration possessed only 32 aeroplanes at the end of 1910. After the execution of the purchases at present in hand, it will be in possession of 174. Negotiations have also been entered into for the supply of new machines.

The machines in use in the Army are of the most varied types; biplanes of the H. Farman, M. Farman, Breguet, Sommer, Voisin, &c., types, and Blériot, Deperdussin, Morane, Nieuport, Antoinette, and REP monoplanes. Wide diversity of this sort is an inevitable inconvenience. In the present state of aviation it is impossible to think of establishing a single type of aeroplane. No particular machine has as yet shown itself superior enough to the others to be exclusively adopted.

The War Office proceeds in the following way :—

The purchases are distributed amongst the different manufacturers of machines the performances of which have been noticed by the authorities, and the machines considered as being capable of giving good service in war. The expenditure is spread in such a way as best to support the industry. Profit is moreover taken of all progress which is attained by the latter as it occurs.

This method is reasonable and economical, and does not create a monopoly in favour of any particular firm, which, in the present state of affairs, would be as illegitimate as unjustified. To admit that we shall definitely choose one or two suitable types would be to create a privilege for the manufacturers of these types, and this, to the detriment of the finances of the State by the suppression of competition, and to the prejudice of aviation by the stopping of all progress. Further, if we refer to the results of the great contests which have recently been carried out in France (Paris-Madrid, Paris-Rome, and the Circuit of Europe), it will be seen that fairly numerous machines have shown more or less even qualities, and placed themselves in the same rank as those which it is possible to use for Army purposes. In the European Circuit, for example, there were 40 starters, of which 27 were monoplanes and 13 biplanes. Amongst those which finished the course were counted the same proportion of both, *i.e.*, 6 monoplanes out of 27, and 3 biplanes out of 13, the first of five different makes and the second of two. These results fully justify the principle worked upon by the War Office as regards purchase arrangements, *i.e.*, orders are given to all qualified constructors, and equitably distributed between biplanes and monoplanes. The conditions imposed for the taking over of machines are, moreover, made more and more severe, in accordance with the progress of the manufacture of aeroplanes. The taking-over tests are always carried out under the care, and at the expense of manufacturers.

As a general rule, and particularly for a new type of machine, the manufacturer is required to train one or several pilots, whose instruction is only considered complete when they have successfully undergone the tests of pilot aviator. It is, however, an undoubted fact that the diversity of machines in use renders the organization of aerial units for mobilization very difficult. Machines of a single type would allow the renewal of parts and speedy repair. This inconvenience will be partly corrected by grouping the machines of similar make together; thus, whatever may be their difference, types will not be more numerous than groups. Another very simple means of lessening the inconvenient differences of types used, from the point of view of the training of pilots, would be to adopt a uniform system of control; this improvement would allow an aviator quickly to become accustomed to the driving of any machine. This question has been studied, and has now attained a certain degree of finality.

The War Office has been reproached with prodigality for buying various machines which are now unusable. The fact is true as regards four machines which were ordered at the end of 1910, and delivered at the beginning of 1911. It was recognized that they were dangerous, and they were altered. A mistake of this sort, which is only one of 2 per cent. of the total number of machines required, and of 3 per cent. of the total expenditure, has nothing in itself which can disturb public opinion, happening, as it did, at the starting of an organization so delicate as that of military aviation.

With the object of avoiding similar mistakes in future, however, the War Office has had recourse to an ingenious method which offers all the advantages of public adjudication, and also, at the same time, directs manufacturers towards the invention of types best suited for military requirements. The war aeroplane should, of course, be stable and fitted with a perfect motor; but, in addition, it should possess special qualities of being able to lift considerable weight, and to ascend from and land on various sorts of ground. To realize progress in this direction, the Permanent Inspector of Aeronautics organized a competition based upon the results of the mean of all the performances as regards speed, length of time in the air, height, and weight carried. This competition took place near Rheims; it comprised two phases: the first, a period of eliminatory trials during October; the second, decisive trials of those machines left in. The elimination trials included an examination of construction, and the necessity of carrying out six flights under military control. The following is a programme of the trials:—

1st Flight.—To fly from Rheims to a landing ground of ploughed field near Montcornet, a distance of about 45 kilometres, with 300 kilograms of useful weight, *i.e.*, not including the necessary petrol and oil to carry out the flight, the tools, spare parts, &c.

2nd Flight.—Between Rheims and Montcornet under the same conditions as above, except that the landing and re-starting ground at Montcornet to be a field of clover.

3rd Flight.—The same as above, but the landing and starting ground at Montcornet to be a stubble field.

4th Flight.—Under the same conditions as above as far as weight carried is concerned. The machines to start from Rheims, fly to and turn at the obelisque at Mourmelon, and return to Rheims, a total distance of 30 kilometres (this flight to serve as a comparison between quantities of fuel actually used by machines and that declared by the the manufacturers at the opening of the competition). If the declaration had been less by 10 per cent. than the reality, all the trials completed had to be recommenced.

5th Flight.—To be carried out with a full load of 300 kilograms, not including fuel and oil. This flight to test climbing powers. The machines had to rise 500 metres in 15 minutes.

6th Flight.—Exactly the same as the 5th above.

The final test was a flight of 300 kilometres out and return, without landing, with 300 kilograms of useful weight, and was carried out on the 13th November from Rheims to Amiens and back. This test classed the competitors in accordance with the best speed, *i.e.*, the shortest time taken.

As a result of the very severe conditions imposed, the results of the trials were adjudged satisfactory by the military authorities.

On the 30th September, 31 machines were passed by the military commission: 20 biplanes, 9 monoplanes, and 2 triplanes. On the 4th November, the results arrived at were as follows:—

	Number.	Monoplanes.	Biplanes.	Triplanes.
Machines entered and passed...	31	20	9	2
Machines admitted to final test	9	3	6	—

The following is a detailed list of qualified machines:—

No. of Machine.	Name of Manufacturer.	Name of Motor.	Power.	Type.	Pilot.
1	Breguet	... Gnome	... 100 H.P.	Biplane	... Moineau.
3	M. Farman	... Renault	... 70 H.P.	"	... Bara.
7	"	... "	... "	"	... Renaux.
21	H. Farman	... Gnome	... 100 H.P.	"	... Fischer.
24	Savary	... Labor	... 70 H.P.	"	... Frantz.
29	Deperdussin	... Gnome	... 100 H.P.	Monoplane	... Prevost.
31	"	... Anzani	... 80 H.P.	"	... Vedrines.
38	Nieuport	... Gnome	... 100 H.P.	"	... Weymann.
13	Breguet	... Canton	... 120 H.P.	Biplane	... Bregi.

During the final test the aviator Weymann was first, and covered the 300 kilometres in 2 hours 34 minutes, thus establishing a record of all methods of locomotion by maintaining an average speed of

177 kilometres per hour ; and it must not be forgotten that he carried his mechanic and 225 kilograms of weight to complete the obligatory 300 kilograms.

In future, purchases from private firms will be surrounded by all desirable guarantees. The State has not yet the intention of becoming a manufacturer of aeroplanes ; many officers, however, have undergone the courses at the Superior School of Aeronautics, and the names of others have been entered for those of 1912 ; there is, therefore, an evident tendency towards the progressive recruitment of a staff able to render service in the construction of aeroplanes.

From now on a service of repairs is being organized in different centres of aviation under the care of Government workmen ; these are mainly repairs unforeseen by the Budget.

THE EMPLOYMENT OF THE AEROPLANE DURING 1911.

We will pass over rapidly the numerous individual performances effected by our officer aviators during 1911. The heading " Military Aviation " figures permanently in the Press, and each day a fresh exploit is mentioned. These are fine sporting feats which show the mastery acquired by our pilots and the fact that they are accustomed to long aerial journeys.

Our attention is more particularly fixed, however, by the new line undertaken this year : the methodical study of the military employment of the aeroplane.

In April, the first flights in groups were started ; in June and July, thousands of miles were covered in actual aerial manœuvres, during which 12 aviators, working on well-defined schemes, methodically explored the northern frontier between Calais and Mezières, and then, with the idea that Paris was besieged, reconnoitered the lines of the Somme, the Oise Valley, &c. In July and August, experiments were carried out by the Artillery Regiments of the 2nd Army Corps at the Camp de Sissonne, and then at the Camp de Chalons, with the assistance of the Director of Field Firing, in order to study the employment of the aeroplane in conjunction with Field Artillery with the object of guiding it to its objective when lines of direction are difficult to locate, and to control fire on these objectives. The same experiments were carried out at Chalons and Verdun with siege artillery, and were followed with keen interest by a large number of general officers.

It would take too long to mention all the manœuvres or movements of all arms at which aviators, and especially those of Chalons, have taken part ; we will, however, mention the autumn manœuvres of the 6th and 7th Corps during which our fourth arm showed its vitality and the progress, from a military point of view, which it had accomplished.

It is unfortunate that the northern manœuvres could not take

place; aeroplanes could have played their part there under conditions where distances and the forces employed would have been more in proportion with their great capabilities as a means of information, communication, and transmission.

The autumn manœuvres have, however, been the occasion of a test of mobilization of the personnel of our pilots able to take the field; the Minister of War did not hesitate to call upon the sense of duty of aviators of the Reserve—some 20 of these, amongst whom Vedrines, Legagneux, Aubrun, Renault, Fourny, Sommer, Helen, Martinet, Loridan, de Nieuport, &c., took their places in the aerial units. The following is a list of the pilots and the machines with which they took part in the manœuvres:—

Manœuvres of the 7th Army Corps.

Commander: Captain Félix, on a Blériot machine.

1st Section.—Captain Bellenger (attached to the 19th Artillery Brigade) (Blériot); Lieutenant Clavenad (Blériot); Lieutenant Chevreau (Blériot).

2nd Section.—Captain Echemann (Blériot); Captain de Goys (Blériot); Lieutenant Ducorneau (Blériot); Lieutenant de Malherbe (Blériot); Corporal Legagneux (Blériot); Lieutenant Ludemann (Breguet); Lieutenant Gourlez (Breguet); Lieutenant Peralda (Breguet); Lieutenant Migaud (Breguet); Sergeant (Reserve) Moineau, Lieutenant Davy, Staff, observer (Breguet); Captain Casse (H. Farman); Lieutenant Remy (H. Farman); Lieutenant Blard (H. Farman); Sapper Bill (H. Farman); Sapper Loridan (H. Farman); 2nd Lieutenant (Reserve) Martinet (H. Farman); Lieutenant Tretarre (Deperdussin); Corporal Auburn (Deperdussin); Corporal Pascal (Deperdussin); Reservist Tabuteau (Morane); Reservist Vedrines (Morane).

Manœuvres of the 6th Army Corps.

Commander: Captain Etévé (Captain Pichot-Duelos, observer), on a M. Farman machine.

Lieutenant Cheutin, Captain Girandeau, Staff, observer (M. Farman); Sapper Fourny (M. Farman); Sapper Renaux, Captain Bares, Staff, observer (M. Farman); Lieutenant Mailfert, Lieutenant Dorsemaine, Staff, observer (H. Farman); Lieutenant Camerman, Lieutenant Boncour, Staff, observer (H. Farman); 2nd Lieutenant Menard (H. Farman); 2nd Lieutenant Fequant (Nieuport); 2nd Lieutenant Maillols (Nieuport); Naval Lieutenant Delaye (Nieuport); Sapper de Nieuport (Nieuport); Sapper Helen (Nieuport); Sapper Schlumberger (Antoinette); Sapper Latham (Antoinette); Reservist Colliex (Voisin); Lieutenant Gouin (Blériot); Lieutenant Lelievre (Blériot); Lieutenant de Montjou (Blériot); Reservist Sommer (Sommer); Reservist Kimmerling (Sommer); Reservist Bathiat (Sommer); Reservist Martin (Sommer).

The units of each side included, generally speaking, four or five machines as far as possible of the same type, with sheds, transport, and the necessary motor cars.

Further, an experimental section also took part in these manoeuvres, and carried, in addition to its sheds, a park comprising :

- (1) Fast and powerful motors for carrying help to machines which had landed some distances from their sheds, and organized so as, if necessary, to bring them back by road.
- (2) Motor lorries carrying a mobile reserve supply of spare parts, &c. (fuel, oil, motors, propellers, wings, &c.)
- (3) A mobile workshop for the maintenance and repair of machines. It has been found possible by means of this workshop to effect rapid repairs on the spot of many machines which have been badly damaged as the result of rough landings, and to place them in use again before the end of the manoeuvres.

The Press was unanimous in its views as to the success gained by the aviators during the manoeuvres. They flew every day under medium atmospheric conditions and were employed to carry orders, ensure intercommunication, and, above all, to effect reconnaissances before and during a battle. To show what the reports were which were supplied, and to what a degree they contributed to help the leaders to direct their forces, it would be necessary to reproduce the confidential reports supplied by high military authorities. We will merely give a few characteristic examples taken from the manoeuvres of the 6th Corps in the Meuse stated by the Press.

On the 11th September, the aviators of the Red Army left Bar-le-Duc and located the position of the Blue column (42nd Division) marching on the Varenne-Clermont road, with its advanced guard at Clermont, at a distance of 80 kilometres, before 7 a.m.

On the 17th September, the Blue aviators, after two reconnaissances, discovered the movements of the opposing main body across the forest of Maugiennes carrying out an out-flanking movement.

On the 18th September, after a short reconnaissance, a staff officer observer of the Red Army was able to supply a detailed sketch of the Blue position, on the precision of which he was congratulated by the general commanding the 6th Army Corps.

The rules as to maintaining a minimum height of 500 metres were rigorously carried out by the aviators. After a certain amount of inevitable hesitation, the staffs quickly became familiar with the handling of their aerial units; they issued the most suitable orders and assured, under favourable conditions, the rapid transmission of information. Thus, at the manoeuvres of the 6th Army Corps, one could frequently see aviators land at 5 or 10 minutes' intervals near the commander's position, state their information to a staff officer, and start again on another mission.

If modesty did not prevent us from saying more on this subject we could bring as evidence the flattering statement of a German officer who followed our last great manœuvres, Naval Captain Von Pustau, one of the most noted specialists as regards aviation, from the other side of the Rhine. He wrote: "Without entering into all the details of the feats accomplished by each aviator, it suffices to note that in the three cases they rendered considerable services, services which no other means could have rendered, and that in a strong wind which would have stopped the exit of any sort of dirigible." These are his conclusions: "These manœuvres have proved that the French fourth arm exists in fact—and not merely in name—and that it is able to render the greatest services to its own forces and incalculable danger to the enemy. We are far from being in this state of affairs in Germany, and it is necessary to make great and serious efforts and to expend a considerable sum of money before we can think of endowing our staff with mobile aviation sections."

THE MILITARY PROPERTIES OF THE AEROPLANE.

After the conclusive experiments which have marked the year 1911, aeroplanes have the right to a place in army organization. We will not go so far as people who have not studied the subject deeply, and who have seen in the employment of the new engine of war the possibility of changing the features of wars in the future, or even to say that it will take a preponderating place. The suppression of cavalry, and the destruction of fortifications by the throwing of explosives, have even been spoken of. The aeroplane is a day-bird; it is, also, one of the spring and summer; the final test of the Rheims trials fixed for the 4th November could not take place until the 13th on account of the state of the atmosphere. The aeroplane, in our opinion completes the means of reconnaissance; it is not yet able to replace all in every circumstance. The aeroplane is, beyond doubt, a remarkable instrument of observation from the military point of view; in moderately still weather, at a height of 600 to 800 metres (which assures to it an almost complete safety in the face of rifles and guns), the aviator can see the ground outstretched before him with but slightly modified reliefs, and in its smallest topographical details, its network of roads, of railways, &c. With some practice the aviator will find no difficulty in placing, guiding, and re-directing himself by the map with the greatest precision. And, if troops happen to be placed in the field of observation of a reconnoitring officer, they will inevitably be discovered, their numbers known, and their position reported, whether they are marching in column on the high road or deployed across the country, or whether they are re-formed and not hidden by the formations of the country, the woods, orchards, &c.; or, if they have already taken up billets, they do not disappear into them at the first noise of the motor.

We will give a few figures. At the present time, the aeroplane allows a reconnaissance to be made at a speed of 80 kilometres an hour to a distance of 100 to 125 kilometres in front of the army, *i.e.*, at four days' march. The information brought back to the commander, if the machine has manœuvred outside the general line of march, will give the situation on a strip of country about 7 to 8 kilometres wide. Further, the observations which it brings will have been made one or two hours previously at most. Soon, no doubt, these reports will be transmitted instantaneously; on the 29th July, 1911, Captain Brenot and Lieutenant Menard, while they were moving at an altitude of 500 metres near Rambouillet, were able to transmit a message to the Minister of War via the Eiffel Tower, 50 kilometres distant.

Let us compare the reports of aviators with those which the light reconnoitring parties, and the entire system of information of a cavalry division operating over the same country, can gather. Aviators discover, not merely the apparent fringe, but the mass of the enemy; they give reports depicting a situation still exact at the time of their return, whilst that of cavalry dates from 24 or 48 hours before. For, even if cavalry divisions are endowed with the most perfect means of the transmission of information, their instruments are, in any case, simple troopers, chased by hostile patrols, who bring the information gained by officers to the commander.

What a great influence will these aviation units, if well trained, not have upon strategy and tactics!

Provided with such a means of information, the commander is in a position to direct his forces with certainty towards the main body of the enemy, to decide, upon recent reports, the degree of readiness of his troops for battle, and, when the enemy is far off, to economize his forces by means of a reduction to a minimum of his protective services.

At the moment of gaining contact, when the detachments or the advanced guard of the enemy are met with—will our wish be to carry out a frontal attack in the place of a rapid turning movement, when the aeroplane can determine in a minimum of time whether his detachments are or are not backed up, or if his wings are supported?

When battle is joined along the whole front, simultaneous reports as to the entire situation are necessary to guide the commander, to determine the extent of the position, the strength by means of which a certain point is held by strong and hidden reserves, to watch the flanks for any possible turning movement, or to prepare the way for a manœuvre. A biplace machine, starting from the commander's position, will be able with an experienced observer to reconnoitre, in one hour, at least a zone 6 to 8 kilometres wide and 20 deep; thus, four machines will suffice to observe at close interval the battlefield of an Army Corps, our large fighting unit.

This valuable instrument of reconnaissance, the aeroplane, can also render the best services for the transmission of orders and inter-communication in large bodies. If the commander of an army wishes to send urgent instructions to one of his subordinates, to the commander of a length of the front, or of the main body of a flank detachment whose taking part in the battle is awaited—what messenger can be more rapid than the aeroplane, when the roads behind the front are blocked with troops hastening towards the battle, by regimental transport, parks, and convoys; when the telegraph and telephone lines are being cut at every moment, and when wireless messages are constantly blurred?

Further, if the Commander-in-Chief wishes at any moment rapidly to know the position of his units, to be placed *au courant* with their success or the contrary, or to follow the fluctuations of the fighting lines, an officer of his staff can take his place with the pilot of an aeroplane, observe, note, and return to give an account, within a very short time, with more precision than the commanders, whose attention is absorbed, can send in hastily drawn-up accounts.

It remains to speak of the aeroplane as a fighting machine, though its rôle, from this point of view, still seems uncertain. Will aeroplanes be sent to attack dirigibles after having been fitted with an apparatus for throwing objects in order to tear the envelopes and explode the gas (an experiment at the Eiffel Tower during last spring)? Can they, finally, carry a sufficiently great weight of projectiles or explosives to throw upon stations, dépôts of material, groups of troops, &c.? It is still very difficult to give an opinion upon these points, but experiments have been undertaken which, together with a recently established competition, will doubtless increase the number of inventions, and bring the question to some degree of finality in the near future. The Italians are now carrying out work of this sort to the detriment of their opponents; aviators have several times thrown bombs on to the Turkish camps and created complete panic.

Finally, the aeroplane will be a most valuable auxiliary to our artillery, which is already the finest in the world; thus, our two elements of superiority will associate themselves happily together. For the artilleryman, as a matter of fact, to *see* is the first requirement. To *see*, in order to regulate fire and control its effect; to *see*, in order to recognize the target and decide upon its importance and the usefulness or the reverse of firing upon it.

The French firing, which is almost completely indirect, already necessitates for battery and group commanders the use of an observation ladder, but these ladders, being of small height, only allow of vision between the battery and a near contour of ground. They are useful against an enemy using direct fire, and therefore placing his batteries on the contour of ground visible from the hostile batteries; but observing ladders are insufficient if the enemy posts his batteries

behind the crest, thus, following the French example, the general tendency of European artillery is to take up a hidden position. Under these conditions the artillery is invisible ; as also are groups of cavalry and infantry. It is necessary, however, to see something if one does not wish to fire into the blue. Major Buat, in his recent book on Field Artillery, writes : " Such is the virtue of modern artillery that even in darkness, if one may say so, it is capable of employing all its power with the one condition that a single man can see and think for it." A sole means is open to us : to rise in order to see. As it is, battery commanders use every chance means near the battery position to do this. They ascend church towers, climb trees and haystacks ; besides the fact, however, that there is often no haystack, tree, or tower available, a battery commander cannot, under all conditions, make such ascents, and it generally happens that the height of these natural observing points is insufficient sensibly to modify the visible contour of the ground seen from the battery itself. In order to see over the ground concealing the target it is necessary to rise to 500, 600, and sometimes 1,000 metres above the ground. Where can one find a ladder of this height ? There is only one solution : to call in the aeroplane.

Experiments made at Chalons and Verdun by the Committee for Field Firing of Siege and Position Artillery have shown that an aviator is capable of watching targets and controlling battery fire at the same time. As a result of these experiments, the Minister for War expressed his opinion as follows : " The results obtained are such that it is possible to say that these machines are auxiliaries of the greatest service, if not indispensable, for the finding of targets and the control of artillery fire." This opinion is confirmed by the lessons of the present Italo-Turkish War. A single despatch brings out the two uses of finding a target and fire control : " The Italian artillery *having succeeded, with the help of an aeroplane* driven by Captain Moizo, *in locating the position of the Turkish artillery* (finding a target), opened a violent fire which *the aeroplane reported as correct and efficacious* (fire control)." The results of the experiments carried out by the artillery are of capital importance for that arm and for the army in general. The use of the aeroplane with artillery, in that it allows the latter to *see*, increases the power of artillery one-hundredfold.

It is necessary, therefore, to endow the artillery with the aeroplane. Ought we to go further and form artillery aviation ? This would, at all events in the present circumstances, be premature.

The artillery does not want for good arguments in favour of the latter course, however ; they say that, as the aeroplane is the ideal observation post, aviation should become as much an integral part of the artillery as the present observation ladder. And, the aviator being indispensable, it is necessary that he should be able to work

all the time, or, at least, when the artillery commanders judge it necessary. Can one call upon the aviators grouped together in a distant park at the disposition of the Army Corps Commander? If the artillery commanders are forced to ask for the help of aviators through the regulation channels, they would never arrive in time to be useful.

They say that aeroplanes should be a part of the artillery, and in effect, they can be transported with it and be placed near it. The establishment at Vincennes has constructed a lorry for the transport of aeroplanes. A section of three aeroplanes on lorries carried out the great manoeuvres in the East. Loaded at Vincennes with the artillery of the 8th Corps, it was unloaded at Besançon for the artillery concentration. During the 10 days' duration of these manoeuvres the section followed its artillery. Each day, the artillery commander gave the aeroplane section commander his billeting place, the position of the park, and the point where one or two aeroplanes should be ready for his use the following day. The aviator found his horse at the place of rendezvous, and came to the artillery commander for his orders; he was at the disposal of the latter all day, flew when necessary, and landed conformably with the position of the batteries.

The aeroplanes on these lorries were moved with the artillery in the same way as the ordinary artillery wagons. Aeroplanes can, therefore, march everywhere with artillery. They are, in future, indispensable to that arm, and it is urgently necessary to create artillery aviation.

Such are the artillery arguments in all their force. We appreciate their value. And we are absolutely convinced of the importance of aviation in order to render gun fire real and efficacious. But it is necessary to recognize that the aeronautical service is right when it says that it is impossible at present to create artillery aviation. We shall not have—very far from it—enough aeroplanes in 1912 to endow each artillery group with a section of aeroplanes on lorries. A thousand machines would be necessary. In awaiting the development of aviation, material and personnel must remain attached to the Army Corps, and we must trust to the General Officer Commanding the Army Corps to employ the group of aviators placed at his disposal in the most judicious way possible; it is in this way that the first section of aeroplanes was specially attached to the group of batteries of the 19th Brigade during the manoeuvres of the 7th Corps.

Thus far we have only dealt with the practical reasons, based on facts, which justify the development of our military aviation service; moral reasons are also in its favour. The brave and daring feats of our aviator officers flying to discover the movements of the enemy will be an incomparable example for our soldiers.

In conclusion, strategic reconnaissance to a great distance and tactical reconnaissance to a lesser one are the great and essential

rôles of the aeroplane. These would have for their object to determine as a whole the movements or the situation of the enemy. Thus, the first object to be attained by the military service of aviation is easily seen; it is necessary to allot an aerial squadron to each of our large units and our cavalry divisions.

These squadrons will be placed, in the same way as certain other units—telegraph companies and engineers—under the direct orders of the Chief Staff Officer.

The parks of these units should be organized in such a way as to allow the units to come under shelter within easy reach of the commander, &c. The credits sanctioned for 1912 will allow of a part of this programme being realized; we have seen elsewhere that the creation of new centres of aviation will permit now in time of peace the staffs to become used to the employment of aeroplanes.

THE AEROPLANE AND CAVALRY.

We have now to do with the very dangerous discussion which is spreading more and more amongst the public, often ignorant of military matters. It is frequently said: "Aeroplanes and dirigibles are wonderful instruments for reconnaissance, and their power of investigation is far superior to that of cavalry. Let us do away with or reduce the cavalry." The time has not come to reduce this arm under the pretext that its rôle in battle, in face of modern rifles and guns, being insignificant, the cavalry has now lost its sole *raison d'être*—the search for information.

The public must not be allowed to wander in this matter, and we will, therefore, allow ourselves briefly to judge this opinion, and to reassure the French Cavalry.

During war the cavalry has a triple rôle to fulfil:

- (1) To procure information of the enemy.
- (2) To protect troops on the march or halted against surprise, and to cover their movements.
- (3) To intervene in the battle in order to complete success or to protect a retreat.

From only one point of view, that of supplying information about the enemy, may dirigibles and aeroplanes often be able to replace cavalry, but it is necessary carefully to determine to what extent; we must take the aeroplane as it is, a relatively crude instrument which flies its 200 or 300 kilometres at a constant speed and returns to its shed.

It must be remembered that the machine is still unable to fly in fog, and, even if it could, one can see nothing under these conditions; one cannot observe well in strong winds; it is impossible to fly each day, and that it is unusual that, even during fine weather, if one wishes to economize in very valuable personnel, that more than

three or four hours' flight in the morning, and two or three hours in the evening, can be made.

Further, the aviation reconnaissance is essentially a rapid one ; the aeroplane only passes, its field of observation is not very detailed, and, at times, at a place where it has seen nothing, a unit may be found emerging from a wood or village, having awaited a propitious moment to commence its movement.

On the other hand, cavalry reconnaissance, in which small and large elements are employed, is characterized by the permanence of day and night contact ; it has less opportunity than the aeroplane of discovering the enemy's masses, but, by the numerous points of contact, which it has established with the enemy, it may succeed, by means of progressive bounds, gradually to determine the apparent line, if not the exact situation.

Thus, the aeroplane should not replace the cavalry, even for reconnaissance. Its action should supplement and complete it.

When the enemy is far off, the reports gained by the aeroplane may be able to afford a certain security ; as he comes near enough to gain contact with the advanced lines by means of a night march or forward effort of his cavalry, it is the cavalry which will allow us to ensure, with a minimum of strength, the protection of our billets. It will permit our columns to march without being checked by demonstrations of cavalry supplied with a few guns. And it will, finally, cover our positions of assembly during the battle. When the enemy is everywhere and his cavalry, energetically handled, searches for badly covered troops, how many aeroplanes would be necessary to ensure this protective service ?

In conclusion, one should not allow oneself to be deceived by the technical progress gained : moral forces play the principal rôle in battle ; the infantryman and artilleryman are open to discouragement, and to the influences of fatigue, anxiety, and fear ; crises are produced during battle when the nerves have reached a maximum tension, and the masses of men are ready to be carried forwards or backwards in accordance with their enthusiasm or terror.

A keen and well-commanded cavalry, employing its mobility in order to intervene by surprise and so find harmless rifles and guns, will thus decide the situation.

We hope the matter has now been well thrashed out : the employment of the aeroplane or dirigible will not make us decide on the possible reduction of our cavalry ; we will go even further and say that we must, without delay, place our cavalry, already too inferior in numbers, in a state to figure gloriously in front of the German cavalry which, on a peace footing, does not count less than 510 squadrons.

DIRIGIBLES (AEROSTATION).

The War Office is continuing the methodical and prudent execution of the programme decided upon on the 25th February, 1910, without asking other credits than those resulting from the engagements arranged previous to 1910. The word prudent is used because the progress of the aeroplane imposes a period of observation. Aeronautics are undergoing an evolution which is characterized by the substitution of the heavier for the lighter than air machine. The War Office is carefully watching the phases of this evolution, and continually conforms with it. We are passing through a transition period to which the fluctuations of public opinion bear witness. On the 2nd September, Monsieur P. Rousseau wrote in the *Le Temps*: "If the dirigible has not disappeared in the face of the aeroplane, it seems likely before long to pass to a second rank until it is completely supplanted and relegated to the past." But, on the 2nd October, after the brilliant flight of the "Adjutant Reau," the same paper published the following: "In the face of these results the most convinced partisan of the aeroplane must admit that this machine is ripe neither for night reconnaissance nor for the use of wireless telegraphy, and that there is occasion to imitate the example of our Eastern neighbours, that is to say, actively to forward the development of our dirigibles at the same time not neglecting that of our aeroplanes."

The opinion of engineers on military aeronautics is that during at least a few more years dirigibles will play a decided rôle in war and one in which they cannot be replaced.

During the great manœuvres of the East, five dirigibles of different types manœuvred towards the Lorraine Frontier. These were: "Le Temps," "l'Astra-Torres," "le Capitaine Marchal," "l'Adjutant Vincenot," and "l'Adjutant Reau."

Trials of rapid filling by means of a new process of preparing hydrogen on the spot were carried out with two of these dirigibles. The experiments were very important, for, in order to be ready to proceed to a useful reconnaissance, the aerial cruisers must be ready to leave the fortified camps of the East on the day following mobilization. This condition was realized; on the 7th September, the dirigible "Le Temps" was filled in $2\frac{1}{4}$ hours, during which time 2,700 cubic metres of pure hydrogen was produced by means of a wagon containing hydrolite. The hydrolite wagon only weighed 2,400 kilograms, and gave the same service as four tube wagons weighing 12,000 kilograms. This filling process has an evident superiority over all those yet known.

An examination was also made during the first days of September with a process of preparation called silicol for the purposes of fortress use. The "Capitaine Marchal" (capacity of 10,400 cubic metres),

was filled in 16 hours, the machine having supplied a continuous flow of 650 cubic metres per hour. Thus we know to-day that the largest dirigibles can be filled with hydrogen produced on the spot in a few hours, an operation which hitherto required weeks to effect. Unfortunately, the setting of the engine and arrangement of the weight of the car cannot be carried out in as short a time as the filling. There is, therefore, progress to be made in this direction.

Difficult reconnaissances carried out by three dirigibles revealed a new use of the dirigible as regards night travelling and the use of wireless telegraphy.

Aeroplanes cannot reconnoitre at night; they must see to land; in case of motor failure a dirigible is merely transformed into a free balloon. The great manœuvres of the East have permitted an experiment in tactics of using the night to go to the zone required to be reconnoitred. On the 12th September, the "Astra-Torres" left Belfort in the middle of the night in a strong easterly wind and, at Vesoul, dropped a sack of messages which it had been ordered to take, and returned to Belfort without having been seen. During the following night it made a similar journey in another direction. The "Adjutant Reau" left Paris, kept the air during 21 hours, and flew 850 kilometres. The Fortress of Verdun, though warned that it would pass, did not see it in spite of electric searchlights until it had passed by to a distance of 35 minutes' flight.

As regards wireless telegraphy, the flight of the "Adjutant Vincenot" established the fact that, thanks to an installation on board, communication can be maintained with the Eiffel Tower, and the Minister for War kept *au courant* with observations as they are made.

This airship reconnaissance is a reason for not abandoning the valuable instruments for gaining information which we possess. It is no longer a question of creating a numerous fleet; we should at least maintain in a perfect state of readiness the number of scouts and cruisers considered strictly necessary. The existing units ready for service are, over and above the 3 school dirigibles, 4 dirigibles in full use: "Le Temps," "le Capitaine Marchal," "l'Adjutant Vincenot," and "l'Adjutant Reau." At the end of 1912, as a result of the completion of the programme undertaken, and of the employment of the allotted credits, our Army will be in possession of 11 dirigibles, of which 8 are cruisers and 3 scouts. The installation of a dock comprising 2 dirigible sheds is being continued at the four great fortresses of the East.

XVII.

THE TRAINING OF THE TERRITORIAL FORCE.

A.—MOUNTED BRIGADES.

By Colonel Sir LANCELOT ROLLESTON, K.C.B., D.S.O., Commanding
Notts and Derby Mounted Brigade.

FOUR years having now elapsed since the formation of the Territorial Army, it has been suggested that a few observations upon the experience gained in the training of its Mounted Brigades may be of service.

It is generally considered that the first essential in all training is the thorough understanding by everyone concerned of the object aimed at, and as the object in this case is the qualifying of the Mounted Brigades to perform for the Territorial Force the duties performed by the Regular Cavalry and Mounted Brigades for the rest of the Army, the problem is to ascertain how, under the different conditions of training in the two Forces, a similar result may, so far as possible, be attained.

An important task of the Brigade Commander is to instil throughout his brigade the knowledge that it is to be one unit, to impress the value of preserving complete mutual support and co-operation between its various branches, and, without repressing the exercise when necessary of independent initiative, to insist on the importance of the officers of every branch making themselves acquainted with the use and value of all the rest.

In the case of the three newly-formed units this is easy enough, though some of the Yeomanry regiments who have long been accustomed to act alone, possibly in some isolated district, and to regard the parade of their whole regiment as a climax of concentration, may be somewhat longer in recognizing themselves as only parts of a larger and more efficient whole.

This principle once understood, a necessary preliminary to carrying it into practice is the raising and training of the various units, each in its own duties, a task to which the efforts of the officers of the force are principally devoted, and one which therefore forms the chief subject of these observations.

THE ROYAL HORSE ARTILLERY.

First comes the Royal Horse Artillery, concerning which it will be remembered that when the force was formed, considerable controversy arose among experts as to whether the satisfactory training of this branch under Territorial conditions was not practically impossible.

In practice, the truth, as is not unusual, has proved to be between the two extremes. If we are to rely upon the average Territorial officer with the average amount of spare time to devote to military training, upon the average Adjutant, who, whatever his other reasons for seeking such a post, has no warrant for believing it to be the passport for an officer ambitious of a rapid rise in his profession, upon the regulation number and usual level of efficiency of the non-commissioned officers of the Permanent Staff, upon the average class of recruit, secured perhaps under the pressure of some recruiting boom aimed at by any means completing the tale of numbers, and, above all, upon the amount of public money, less than one-fourth of the sum per gun of the cost of the Regular horse artillery, that has hitherto been spent upon this branch—then the pessimists are right; no horse artillery worth having can be produced by such means as these.

But there are batteries which by adopting other methods have won success.

It is related of Assheton Smith, who reduced to successful practice his theory that there was no fence in Leicestershire that could not be got over with a fall, that in the case of a particularly awkward piece of timber, he would sometimes ride slap at the post, in the belief that the serious obstacle thus presented induced his horse to put on more steam.

And it is in this spirit that the successful batteries have tackled their task.

In the first place, a high social standard for recruits should be firmly adhered to. Such men will join freely enough when they find that no one not of their own class will be accepted; it is remarkable how great an asset intelligence and education are, not only in the power to grasp the details of gunnery and drill, but even in the simpler tasks of learning to ride and drive. It is found, too, that men of this class are much more masters of their own time, and able to avail themselves of all opportunities of instruction.

Esprit de corps, easily brought to a high level among such men, is greatly promoted by the establishment of a Battery Club with billiard room, also used as a lecture room, in which men can meet at night and live in a more or less military atmosphere, and this club should preferably be attached to the stables and riding school.

A permanent establishment of horses in work, varying from five

or six in December to twenty-five in spring and summer, is absolutely indispensable for sufficient instruction in riding and driving, and equally important is the possession of an efficient "riding staff" in addition to the two Sergeant Instructors at present allowed. This should consist of an ex-R.H.A. Sergeant-Major and about five ex-R.H.A. drivers, permanently kept on the premises to look after horses, harness, and guns, to assist in riding school, and in any other way required. It is impossible to over-estimate the value of such a staff. The Territorial soldier is a wonderful imitator, and picks up his duties from example both in stable management or harnessing up, and in the proper bearing of soldiers on and off parade, with great rapidity.

In matters of gunnery and fire tactics the superior class of the men removes all difficulty, and it is only when they reach the stage beyond which success depends more on mechanical habit and practice than on intellectual application, that progress is checked. To combat this, far more practice than is at present obligatory is required.

At Easter, Whitsuntide, and the August holiday, in addition to the prescribed annual training of fifteen or eighteen days, week-end camps of three or four days each should be held, one of them preferably in barracks with a R.H.A. battery, taking over their horses and guns for the time. Three such extra trainings are absolutely indispensable.

Better facilities for shooting at the end of the annual training in camp are badly wanted. It is seldom that practice can be held during this training at all, and when it is, it is not always, as it should be, at the end of the period, and the results of such procedure inevitably and unfairly misrepresent the efficiency of the battery. No Regular battery could do itself any sort of justice, if called upon to shoot without the preliminary special training that is undergone previous to practice camp, which may be said to correspond with the annual training of a Territorial battery.

The men of the Ammunition Column are best trained by making no distinction between them and the men of the battery. They should be trained in the battery, and thus familiarised, not only with the methods of the supply of ammunition, but also with all other duties they would have to undertake in the service of the guns or teams, on being sent up, as they would be, to replace casualties in the battery in action.

The equipment, as it now stands, is satisfactory, except in a few technical details, but the substitution of the 13-pr. gun for the Ehrhardt would be a welcome improvement.

Last and most important of all is the question of officers, of whom it may be at once admitted that while all must be exceptional men, this is particularly so in the case of the Battery Commander and Adjutant, the former of whom must be either an ex-artillery officer,

if one can be found whose service experience has left him keenness enough to undertake so arduous a task, or a born soldier and natural leader of men, who to these characteristics adds the energy to acquire the necessary technical knowledge. The Adjutant should be, in ability and devotion to his work, as superior to the average of his rank as must be the horseman who schools a young horse across country to the rider of a made hunter.

Such are the conditions under which a Territorial Horse Artillery battery may be, and has been made a success, but under those first indicated it is bound to fail.

The amount of work done by such a battery has been too recently detailed in the January number of *The Cavalry Journal* to be recapitulated here, but in view of the high level of the professional model it has to follow, the fine result in some instances obtained is proof that nothing is gained by assuming that any ideal is too high to place before well-led Territorial troops, and that the more we ask from them the more will be accomplished.

YEOMANRY.

The Yeomanry compares less favourably with the Regular Cavalry than the other units of the Brigade with the corresponding branches of the Regular Army, not entirely by the fault of its officers and men.

It suffers more than is realised from the lack of the advantage possessed by the other units, of having a definite professional model to work to, an apparently unrecognized, but really indispensable condition for the satisfactory training of Territorial troops, and the attempt to dispense with such guidance leads to great diversity of practice and promotes various eccentricities.

The remarkable controversies upon the training of Cavalry which followed the South African War and which now, after an unusually eccentric outburst, seem happily to be at last subsiding, have reacted upon the Yeomanry with considerable force.

Every faddist in turn, repelled by the solid resistance of the Regular Cavalry, has fallen back on the Yeomanry as an easier victim, and has pressed upon the authorities the desirability of testing upon that force the value of his nostrums, while the Cavalry, far from offering to their amateur brothers a helping hand, have, so long as they are allowed to retain their own weapons, shown a most cheerful acquiescence in the withholding of that privilege from the Yeomanry.

This no doubt is on the immoral principle of the Russian driver, who, when pursued by wolves, sought to increase his own chances of salvation by throwing overboard his children, but as neither the motives nor the arguments of these controversies are within the scope

of this article, the only necessity for alluding to them arises from the fact that their results, in determining the problem set before us, have a vital bearing upon its real subject, the training of Mounted Brigades.

The training of Regular Cavalry, consisting as it does of the scientific combination of fire with shock, each weapon the complement of the other, differs at every step from that of the mounted rifleman who has no such resource.

The first necessity of mounted riflemen in opposing cavalry is superior speed, without which success under such circumstances is most unlikely; in addition to which marksmanship, fire discipline, horsemanship, activity, and general handiness must be of the highest order.

To obtain all this a considerable improvement in present methods is required.

Instead of being satisfied between the annual trainings with the prescribed preliminary drills, supplemented by a few odd lectures and riding lessons, a systematic winter training as described in detail in *The Cavalry Journal* for July, 1911, should be instituted in every regiment, having as its main feature a tactical exercise in the field each month from November to March, preceded in each case by appreciations, and followed by a lecture and discussion on the result.

This, with one or two staff or regimental tours in which officers of all branches of the brigade should join, will give a more valuable training in tactics, reconnaissance, and detached duties generally than is ever obtained in summer, and will set free the annual training of the regiments at that season for the instruction in mounted drill, horsemanship, and fire control, without which the discipline, handiness, and cohesion so essential in war can never be attained.

A separate training for the recruits of each year in the shape of a thorough grounding in the two essentials of horsemanship and musketry would be of untold value, and would remove the great evil of the present system, that nothing is learnt thoroughly.

Under this system of the neglect of the winter and the devotion of the summer training to detached duties, instruction in manoeuvre consists too often of a series of sham fights, which, though amusing, are of little value, from the fact that they are too often conducted by officers who are without sufficient preliminary practice in giving orders, and by men insufficiently drilled to obey them; the result being rather a playing at war than preparing for it.

Drill, necessarily by this system largely neglected, is, as a rule very weak. It is less common than it should be to find a squadron or regimental commander who can drill and handle his command with any style and facility; a general sentiment is allowed to prevail that, for Territorial troops, drill is of little consequence, the result being

that, when any concentration is required, the Yeomanry as a general rule is slow and unhandy.

These are faults, however, not of the men but of the system; the most satisfactory results, indeed, follow any trouble taken to instruct them properly, and if the improvements above suggested were made by order universal, such shortcomings would quickly disappear.

To carry these into effect a more complete organization than is customary is desirable, and a few details already described in *The Cavalry Journal* may be briefly recapitulated.

A useful method is the subdivision of every squadron or troop into local sections, each under the command of a non-commissioned officer living on the spot, whose duty it is to keep in touch with the men of his section, and to instruct them in all duties throughout the year.

This organization should be emphasized by every man being given a printed roll of his section under the name of its commander, and, the whole being carried out under the supervision of the troop leader and squadron commander, the system affords facility for instruction of every kind, and especially that which demands constant attention, such as signalling and judging distance.

The latter, indeed, can only be effectually taught to Territorial troops under this system—distances being measured from men's own houses, or some spot they pass daily, and they being instructed to familiarize themselves with the appearance of men and horses at each distance under all conditions of light.

No other system is so efficient as this.

THE TRANSPORT AND SUPPLY COLUMN.

The Transport and Supply Column has the advantage that a considerable portion of the men's duties are the same as they are accustomed to in private life, and no effort should be spared, by the proper assignment of duties, to take full advantage of this, as regards both officers and men.

The first essential is the proper equipment of the units with service pattern wagons, horses, and harness. Any attempt to evade this is a false economy; none but honest draught horses should be used, and harness of service pattern should be in possession of the unit throughout the year.

The Transport side of the Company being divided into two half Companies, and then again split into four subsections, every driver has two or three spare men under him, with a pair of horses and two sets of harness to care for, and has thus his own responsibility, and always the same harness and horses under his care, all drivers being trained to ride and drive, as well as with long rein from the box.

Dummy horses are a great help in teaching the fitting of harness and should be used when available.

On annual training, the A.S.C. Company should occasionally leave the standing camp for two or three days under service conditions for practice of convoy duty, adjustment of loads, and preparation of loading tables, the supply section practising all duties necessary for the supply of the brigade.

❑ Schemes on paper giving practice in all the duties of the unit for a brigade on the march should be occasionally worked during the winter, in conjunction if possible with the brigade staff tours.

MOUNTED BRIGADE FIELD AMBULANCES.

The Field Ambulance, under much the same advantages as those of the last-named unit, perhaps of all branches of the brigade most nearly approaches the efficiency of the Regular Army.

The officers are all professional men in full practice, the rank and file of good class, well-instructed and very intelligent, and the whole unit practically fit for its duty.

Drill, driving, and horse management require to be carefully taught, but even here the intelligence of the men is a great asset.

Practice in the wards of a General Hospital where one is available is invaluable, and is generally made the most of.

A great help in the training of the Ambulance, as it also is in promoting the unity of the brigade, is the joining of the officers in the Brigade Staff tours and of the whole Ambulance in brigade training, no considerable tactical exercises being held without the Ambulance performing the whole of its duties as on service.

The weak spot at present as regards this unit is the fact of its being under somewhat divided authority for administrative purposes between the Mounted Brigade Commander and the Administrative Medical Officer of the adjacent Division, an arrangement which causes considerable delay and inconvenience.

It would be a vast improvement if the same system were adopted as that used in the case of the Royal Horse Artillery, the unit being entirely under the command of the Brigadier of whose brigade it forms a part, but who refers all technical questions and inspections to the commander of the Divisional Royal Artillery.

A similar relation of the ambulance to the A.M.O. would work equally well, and greatly promote efficiency.

MOUNTED BRIGADE TRAINING.

The details of training of each unit of the brigade, with possible improvements, having now been dealt with, it only remains to touch briefly upon the training of the brigade as a whole.

Regimental trainings are best held in their home districts, but brigade training should never be held where there is not room for the whole brigade to work together without doing undue damage.

Reconnaissance taught in enclosed country in summer is of little value, the conditions being quite unlike those of war.

A brigade training, on the contrary, held on Salisbury Plain, or similar ground, is invaluable, the objectors to it quite forgetting that its value lies in the fact that there alone it is possible to do exactly what should be done in war without incurring prohibitive claims for compensation for damage.

Progressive training, a term often misunderstood, should be so ordered that the whole range of progress attainable should be practised each day, nothing being entirely left till the final days, a constant change of instruction being thus ensured.

Similarly, even on days of squadron or regimental training, a quarter of an hour is well spent by the whole brigade parading and trotting off to the ground together, changing formation on the way, and dispersing on arrival.

Night work is best left till troops are quite perfect by day. It is noticed that Territorial troops do little work the day before night operations for fear of being tired, and less the day after because they are so. Fifteen days cannot afford such relaxation.

It has been shown above that Territorial Horse Artillery can be satisfactorily trained, but not without some increase in the funds at present assigned to it. That this necessary increase should fall upon the nation, and not as at present upon the officers of the batteries, will be universally admitted, while in face of the extra hard work and superior horsemanship demanded from this branch, their lack of the equitation grant allowed to the Yeomanry seems less than just.

For Yeomanry, the vital necessity is to rouse it to the desirability of a vast improvement on its present state, if, as now armed, it is ever to defeat the cavalry of the Continent, and to the realization of the truth argued out in *The Cavalry Journal* for July last, that for mounted riflemen it is a more difficult, not an easier task than that of cavalry, to win success. This is especially the case in the conduct of the "vigorous offensive," an occasional rôle of even the protective cavalry. Mounted infantry, in such circumstances, are taught by their Regulations to look round for the assistance of cavalry, but the Yeomanry are themselves the cavalry of the Territorial Force, and can rely upon no such aid.

It cannot be too forcibly brought home to our Territorial troops that in war, the most acute of all competitions, nothing is good enough but the best; that in war there is no second prize, but that whereas to be better than our enemy means victory, to be nearly as good means disaster and defeat.

Satisfactory as is, in many respects, the work of our Mounted Brigades, nothing is more evident than how easily, not by extravagant expenditure, but by sound methods, it might be made far better still, while the slight necessary increase of cost but represents the proverbial halfpennyworth of tar upon which it depends whether the ship is saved or lost.

XVII.

(Continued.)

THE TRAINING OF THE TERRITORIAL FORCE.

B.—FIELD ARTILLERY.

By BREVET-COLONEL A. B. HELYAR, C.R.A., Lowland Division.

FOUR years ago, when the Territorial Force was created, probably not a single individual who had practical knowledge of the training of Artillery would have admitted the possibility of bringing a Volunteer force of this arm to anything like a reasonable standard of efficiency for service in the field. The difficulties in the way appeared to be insuperable. No one doubted that the men could be taught gun drill, but when it came to a question of training officers to take their proper positions, non-commissioned officers and men to ride and drive, and whole batteries to work as batteries and not as collections of individuals, then, having regard to the small number of drills per year that the personnel were expected to perform, heads were shaken, and the scheme, though doubtless excellent in organization and very beneficial to the few members of the community who took advantage of it, appeared, so far as the actual defence of the country was concerned, a practical impossibility.

Since then events have marched, facilities for instruction have developed, difficulties have been overcome, and things that appeared impossible have been found to be only difficult, with the result that it is acknowledged by those who have had an opportunity of judging that there certainly exist possibilities in the training of Territorial Artillery which had hitherto been unsuspected.

It is with these possibilities that I propose to deal and thereby to show how, *conditions being favourable*, a training of this arm may be accomplished which will raise batteries to such a standard of efficiency as to make them a not negligible asset in the balance-sheet of Home Defence. It will be noted that I have said "*conditions being favourable*," and I have used the expression because it appears to me to be a *sine quâ non* for efficiency. I should perhaps say here what are the conditions referred to :

- (i) Keenness amongst all ranks in the batteries, and a determination to learn their work even at the expense of a certain amount of personal inconvenience and self-denial.
- (ii) Suitability for the special work of all those whose business it is to train the batteries from the highest to the lowest.
- (iii) Good drill halls, with comfortable accommodation for the non-commissioned officers and men, and an out-of-door training ground for the intermediate season.
- (iv) A suitable training ground for annual camp, and arrangements by which all units of a division can come to camp in turn and be trained by the Divisional Commander Royal Artillery and his Staff.

Should any of the above conditions be not fulfilled, the task will indeed be found a difficult one, and although large numbers of useful soldiers will undoubtedly be trained, it will be very questionable, whether, as units, batteries can be brought to a standard of efficiency proportionate to their cost and equal to the requirements of the country.

ANTICIPATED DIFFICULTIES.

It will be convenient here to summarize generally the chief difficulties that were prophesied on the creation of the Territorial Field Artillery, and then to consider how far these prognostications have been justified by results—generally they were as follows:—

- (i) The training of officers who have been at no military school, and whose time is almost entirely absorbed by their civil professions.
- (ii) The training of men to ride and drive who have not for the most part had anything to do with horses, and who can, at the best, spare an occasional Saturday afternoon and a few evenings a week for drill.
- (iii) The training of the specialists.
- (iv) The training of batteries, as units, to shoot, who will only have about one-third the ammunition for practice that regular batteries are allowed.

Now as to results :

These, of course, vary enormously with local conditions in the various parts of the country, and the class from which the personnel are drawn ; but, speaking generally, I think the following will be found to be a fair account of a large number of Territorial Field Artillery Units in the Kingdom. In cases where it is not so I cannot but think that, on investigation, it will be found that important factors in my *sine qua non* conditions have not been present.

- (i) The training of officers is, and will always be, a great difficulty. The fact remains, however, that amongst the batteries a large number of most excellent officers are now found.

The Territorial Artillery officer is, as a rule, keen enough to put in more time reading the book than most people realize. He is a man who has learnt one profession, and has a very good idea how to set about learning another. He is, for the most part, shrewd and capable; he listens when he is told anything in intelligible English and does not readily forget it. Above all things, he has joined the force because he means to learn the profession of arms, and not as a pleasant avenue to society and sport. The great difficulty is to afford him sufficient opportunities for practical training. It is a matter that has, from the commencement, been exercising the minds of those entrusted with this very great responsibility; courses, lectures, attachments to regular units, follow one another in quick succession, and the number of officers who are found ready to give up their other pleasures in order to profit by the above, and to improve their military education, is very great. The result is that there are already, even after four years only, a very fair number of officers who would be quite fit to take their places in a regular battery going on service. This number increases every year.

- (ii) Curiously enough the riding and driving have given less trouble than anything. The very fact of its being entirely new to the men seems to act as an incentive, and as long as there is sufficient money to provide horses, there is but little difficulty in getting the men to come and ride them. Many join simply because they want to learn to ride, and even buy themselves breeches that they may not have to wait to begin till they are "clothed." The first year a man joins he is not required in the teams but goes on with the recruits' riding and driving drill. The second year he has had two intermediate periods of training and one camp, and he is quite ready and able to take his place as a driver, and bring his gun into and out of action (even on a half-trained horse).
- (iii) The training of specialists does not appear to have been quite so great a difficulty as was generally anticipated. It means, of course, a great deal of work by individuals done at odd times and whenever they can be got hold of, but somehow in a very large number of units a fair standard has been arrived at, in what are, for the moment, the most important subjects, viz., gun laying, fuze setting, and range taking. The signalling is a very great difficulty, as the majority of the permanent staff have not signalling certificates and the adjutant has to train the signallers himself until one of his Territorial officers has qualified himself for the work. The regulation number of drills is not sufficient, of course, for specialists, and in all cases that have come under my

- notice these men have done from 50 to 200 per cent. more than they are obliged under their present terms of service. This alone accounts for results having exceeded anticipations.
- (iv) One of the great difficulties experienced in training a battery as a whole is that of getting all the important members—i.e., officers, non-commissioned officers, and specialists—at the same time. Naturally a night that suits some men may not suit others, and the difficulty is one that is only got over by special exertions on the part of a commanding officer and his permanent staff. However, there is no doubt that a large number of batteries have in four years arrived at a very creditable standard of drill and fire discipline. That is, that a very few weeks (after mobilization) would fit them to take the field, and it is reasonable to suppose that what some have done, others with equal opportunities can do.

TWO PHASES OF TRAINING.

The actual training of Territorial Artillery divides itself naturally into two parts :

- (1) Intermediate training at their own stations ; and
- (2) Annual camp training.

The two phases are quite distinct as to details and as to conditions, requiring separate consideration and organization. They are, however, entirely interdependent, and each is an absolute necessity to the complete fulfilment of the objects of the other. It is, it would seem, from the overlooking of this principle that shortcomings and low standards of efficiency are frequently due. A battery which has done a most excellent intermediate training, which it is for any reason unable to crown with a well-organized annual camp, can, at the best, be only a very partially trained one ; a battery which is brought to camp after an incomplete intermediate training can only very partially benefit by the very best arranged instruction at that camp.

INTERMEDIATE TRAINING.

Taking the two phases in the order above-named we will first consider the intermediate training.

Brigade Commanders.

This is and must be carried out under the superintendence of the Brigade Commander, and he, whether a Regular or Territorial officer, must be a man of experience and skill in training. He must be able not only to lead his brigade in the field, but also in peace time so to fashion it that it will be effectively leadable in war. It is frequently very difficult for Territorial officers to obtain this skill and experience, and, at present, the only way out of the difficulty would appear to

be to attach them for a considerable period either as senior majors or lieutenant-colonels to a Regular brigade of artillery.

As regards the actual training of the batteries, this will vary considerably with local conditions; universally applicable hard and fast rules cannot be laid down as they can in the case of Regular batteries.

There are, however, certain rules which I think should be adhered to.

Recruits.

To begin with the recruits. These men join full of zeal and energy, and they are little more than boys; their course should commence with as little delay as possible after joining, and it *should be a course*, and not a series of intermittent drills. Where necessary, special representation should be made to County Associations with a view to getting the recruits clothed as soon as possible, especially for riding drill, which cannot be well done in their ordinary clothes. The delay for some months of the issue of his clothing has a bad effect on the keenness of a recruit, and it may keep him out of the riding school at the very time when he should be there. His elementary drills should consist of a progressive course in each subject, riding, foot drill, and gun drill, and it should be an understood thing that the recruit when he joins is ready to attend such courses with regularity until he is dismissed from each.

Trained Soldiers.

A good deal more latitude will have to be allowed to the remainder of the rank and file, i.e., those who have passed their recruits' course, and they must be permitted to attend drills when convenient to them to spare the time. A great deal can be done, however, by a good adjutant and permanent staff and energetic section commanders in the getting together of individuals whom it is desirable to have on the same evenings. For instance, a section commander *ought* to be able to ensure the attendance of all, or nearly all, the men of his particular section by giving a few days' notice.

Specialists.

The specialists' work requires, as before mentioned, a good many more than the compulsory number of drills, but these men can be trained, to an almost unlimited extent, individually, which removes a good deal of the difficulty. Their training, if not absolutely complete, should at any rate reach a very high standard before coming to camp.

Battery Training.

Lastly, as to the training of the battery as a whole, it is undoubtedly necessary for a battery commander to be able to assemble on the same night a sufficient number of his men to enable him to have an efficient battery drill, whether it be a mounted drill or simply gun drill. This number is, however, not so large as, without consideration,

might have been expected. Very good work can be done by a battery commander who can get together for battery gun drill the following: 3 officers (B.S.M.), 2 range takers, 4 layers, 4 signallers, 4 Nos. 1, and 16 other non-commissioned officers and men to complete detachments; this makes only 34 in all, and ought to be feasible at any time after the 1st January. A somewhat recent introduction, called the "sand-model range," will be found of enormous value for all work, either indoors or on an enclosed barrack-square. Very simple manipulation of this will turn it into a representation of any ground that may be required for the work in hand with models of targets made of size proportionate approximately to their distance from the guns. By means of these sand models can be taught simultaneously, and as nearly as possible under the conditions of the practice ground, fire discipline, gun drill, laying, fuze setting, observation (with reversed glasses), the different methods of ranging and quickness in picking up targets. It is a more interesting and far more instructive method than that of making an attack on a chimney stack, the door of an outhouse, or a white spot on a wall. There are, of course, many methods of training in the subjects mentioned, and I only mention the above because, having regard to the frequently occurring necessity to train at drill halls or in barrack squares, with reduced numbers and without horses, the "sand-model range" is peculiarly useful to Territorial Artillery.

There are certain subjects which have hitherto received, in most commands, but scant attention, owing to the greater stress laid on matters which have for the moment appeared more important. Among these specially noticeable are:

- (i) The transmission of orders and messages.
- (ii) Ammunition replenishment.
- (iii) Entrenching.

The above should not be forgotten during the intermediate training period.

As to (i) Mounted orderlies should be trained in every battery, and rolls of men so trained kept at battery and brigade headquarters similar to those of the specialists.

(ii) This is the business of captains who, even in the absence of 1st line wagons, should think out their methods in consideration of ground and conditions, and explain them to those concerned (quartermaster-sergeant farriers, shoeing smiths, and section commanders).

(iii) In taking up positions where gun pits or epaulments are desirable, these can be marked, even if digging is not allowed.

General Principle of Intermediate Training.

It is not proposed in this article to go into all the detail of intermediate training, the method of carrying out of which will vary so

much with local conditions. The principle to be borne in mind by those responsible for this training should be that its object is to get the batteries into a fit state to profit to the full by the work they will carry out at the annual camp, *i.e.*, the culminating point of the training. On arrival there a battery should be at least "word-perfect," and, as a machine, at least workable when the button is pressed. A battery commander especially should remember that to attain this object it is absolutely necessary for him to train his battery himself in fire discipline and the various methods of artillery fire. His subordinates must be fully conversant with his drill and his methods. If he permits others wholly to train his battery he will arrive on the practice ground in a similar position to that of the man who assumes charge of an intricate machine to the management of which he is but little accustomed, and with whose mechanism he is not familiar.

ANNUAL CAMP TRAINING.

And now we come to the culminating point of the whole training at which the final touches are given in the preparation for mobilization—the aim and object of our existence.

At the annual camp, batteries, probably for the first time during the year, are practically complete in men, horses, and equipment; here the manner in which they have been trained during the intermediate season is made manifest, and here they have the opportunity of putting into practice what hitherto has only been dealt with theoretically.

It is far from my intention to dogmatize on a problem which admits of many solutions, and with which many highly-skilled officers are annually dealing with most excellent results; the following is, however, put forward as worthy of consideration, and as likely to produce a high average of efficiency throughout the artillery of a Territorial division.

The training of artillery includes a very large number of subjects: Riding, driving, manœuvre, co-operation, horse-mastership, general camp routine, care of equipment, and lastly *shooting*. Important as they all are, the last is paramount; all the others are of but little value if a battery cannot, after years of training and when the supreme moment arrives, *hit its target*. It is natural, therefore, that, as in the Regular Artillery, the greatest stress is laid on this, and that while the other subjects must never be allowed to be neglected, shooting retains the highest position in importance.

Now there are a fairly large number of varieties of artillery fire; they may be generally enumerated as follows:—

- (i) Accurate long range fire.
- (ii) The rapid engagement of targets at a decisive range.

- (iii) Case fire.
- (iv) Fire from behind cover.
- (v) Fire at an enemy behind cover.
- (vi) Fire at a moving target.
- (vii) A combination of two or more of the above.

Each of these requires separate teaching and distinctive treatment. To try to do too much in any one year, having regard to the time available and the ammunition allowed, will only lead to no one method being thoroughly mastered, and it is, therefore, recommended in the case of recently formed batteries to take certain varieties each year, and to make the teaching progressive throughout a period of (say) four years. It will be found that it will take two camps to teach at all thoroughly any one method, or, indeed, anything that is quite new to a battery. The first year, having had a few months' warning, they will have been prepared in quarters and will know fairly well how the particular thing goes. That year in camp they will put it into practice, but there will be no finish about their work, and the drill itself will probably be only moderate; having done it practically, however, and having had their weak points explained, the subject is again studied throughout the year, and at the following camp, as far as general procedure goes, it should be able to be done in quite a creditable manner.

Notice to Brigade Commanders.

It will be seen, therefore, that it is advisable to inform brigade commanders some months before of what their batteries will be expected to do, so that they may come to camp in some degree prepared. This is the first step.

Camp Divisional Staff.

The next is the forming of the divisional staff. The following is a minimum, all being Regular officers :

Divisional commander.

Staff captain.

Gunnery instructor¹ (either one for the whole camp or, what is better, one for each separate brigade).

Recording officer.

Range officer.

The gunnery instructor should invariably be a field officer; he has to teach both brigade and battery commanders. The recording and range officers may be of any rank.

It is very important that all the above should be altogether on the divisional commander's staff and not merely lent to him for the day's or the morning's work.

¹ Alluded to later as the Regular field officer recommended to be attached to each brigade for annual training.

Also are required : One typewriting clerk ; range party ; arrangements for communication (telephone if possible) from gun to target end of ranges.

Distribution of Units over Camp Periods.

The above having been arranged, the batteries commence to arrive in camp. Divisions have usually four brigades Field Artillery ; one heavy battery ; and one Royal Horse Artillery battery (placed under Divisional Commander Royal Artillery for training).

Now comes a difficulty. If all the units arrive in a heap the training cannot be properly carried out, and, in consequence of local holidays, it is sometimes difficult, if not impossible, to get them fairly distributed. The following is an ideal distribution :

Arrive 1st week	..	Royal Horse Artillery and Heavy Battery.
„ 2nd „	..	1st Brigade.
„ 3rd „	..	2nd „
„ 4th „	..	3rd „
„ 5th „	..	4th „

Under this arrangement the whole camp will take six weeks. Should units be more crowded the best under the circumstances must be done, but training will suffer.

Preliminary Examination of Batteries.

On the arrival of each unit the Commander Divisional Artillery wants to know what standard it has arrived at, so as to arrange its work accordingly, and this is done by (1) a gun drill parade ; (2) a mounted parade ; (3) camp inspection ; and (4) examination of specialists.

Days for Practice.

The above is all done in the first five days, and each battery is then ready to do its first day's practice on the sixth day of training. If possible, no battery should shoot on two consecutive days ; if they do, the lessons of any one day's work will not have been assimilated before they shoot again. The best days for practice will, therefore, be the sixth, eighth, tenth and twelfth, though this may often have to be modified in some degree. The 15-pr. batteries fire 200 rounds, which is sufficient for eight series, or two series per day.

Conference and Criticism.

At the end of each day's practice a conference of officers is held, at which all mistakes are pointed out and explained ; immediately after the conference these are typed, issued to batteries, read out again, and explained to all ranks under battery arrangements.

Programmes of Work.

On arrival in camp, units should receive programmes of their work for the week, so that they may arrange their own programmes accordingly. All the days or half-days not taken by the Divisional Commander are at the disposal of Officers Commanding units for their own drills and instruction.

TRAINING OF ARTILLERY IN CONJUNCTION WITH OTHER ARMS.

I have kept to the end, but this rather to emphasize than depreciate its importance, this most important part of Territorial Artillery training. The matter presents the following difficulties :—

1. That time can ill be spared from the already very short period of training ; and
2. That it is rarely that ground can be found which will admit of both combined manœuvre and artillery practice.

During the first few years of a battery's existence it is perhaps well to leave the training with other arms alone until individual battery work has reached a certain standard. After this there is no doubt of the necessity for combined training, and, failing any other solution, Territorial artillery must be periodically trained with the other arms, even at the cost of a certain amount of efficiency in its technical work. Should it be possible in the future to obtain manœuvre areas in the vicinity of artillery ranges, the difficulty will to a great extent disappear. Failing this, there appears nothing for it but for each brigade, say once in four years, in place of carrying out practice, to do their annual training where combined operations can be arranged. In the meantime everything possible must be done to teach officers the science of war, at least theoretically, by means of regimental tours, war games, and lectures.

MISCELLANEOUS MATTERS AFFECTING TRAINING.

There are a few matters which have not been entered into above, but which, by the experience of the last few years, have been shown to affect very closely the standard to which the training of the arm under consideration is brought.

Period of Annual Training.

There is no doubt that 15 days should be a minimum. In a battery of artillery a very large proportion of non-commissioned officers and men have a special rôle to perform, and their absence for any part of the training period means not only imperfect training in their own work but a much reduced standard of efficiency of their units.

Horses.

It is a very great help to the training in riding and driving for County Associations to procure and keep a certain number of horses (say 12 per battery) for work throughout the year. A ride or a driving drill can then always be formed at short notice, and at times when hired horses may not be procurable. The system also gives increased facilities for the teaching to all ranks a very important part of their duties—horse-mastership.

The Attachment of Regular Field Officers to Brigades.

In some commands a system has been instituted of attaching a Regular field officer to each brigade for the annual training. The duties assigned to this officer should be :

- (1) To assist a brigade commander in the training of his batteries ;
- (2) To teach horse-mastership in camp ; and
- (3) To instruct the battery officers in gunnery and the conduct of fire.

The advantages of this system cannot well be over-estimated. Such an officer is able to be with his brigade at times when the Divisional Commander is occupied with other units in camp ; to explain to individual officers all points which have occurred at practice and need clearing up ; and to make the instruction continuous from the beginning to the end of the training. It is most important that this officer should actually live in camp with the brigade to which he is attached.

Care of Equipment.

It is necessary that this most important duty should be in the hands of battery and section commanders, and that they should in peace time train themselves for the responsibility which must be theirs in war.

No officer can be fit to take guns, stores, and harness on service who is not intimately acquainted with them and with the methods necessary to keep them in an efficient state.

This responsibility has till quite recently been left on the shoulders of the adjutants and permanent staff, and unfortunately, under peace conditions, these men are able to cope with the work so that the weak points of such a system are with difficulty brought home. Everything possible should now be done to impress on officers their duties and responsibilities in this respect.

Ammunition Columns.

These are, at present, organized on at least three different and distinct systems, viz. :

- (1) The ammunition column is a kind of depôt which all recruits of the brigade join until drafted into the batteries.

- (2) The ammunition column is an entirely separate unit at a separate station, and with the aid of borrowed equipment is trained practically as a battery. (In some cases the ammunition column even carries out battery practice.)
- (3) The ammunition column is organized and trained as an ammunition column pure and simple with a view to carrying out its functions as such, *i.e.*, the supply of ammunition and the replacement of casualties in the batteries.

It being a matter of organization, the question of the merits and demerits of the above systems scarcely comes within the scope of this article. As far as training goes, however, it will be obvious that—

In case (1) the training, until all the batteries are up to strength, will be that of recruits.

In case (2) it will be a good deal more advanced as the personnel remain with their unit for the whole of their engagement. They are, however, handicapped by having, at the most, one permanent staff instructor who can ill be spared by the batteries.

In case (3) the training will be that which is requisite for their rôle in war, but, the work not being of so attractive a nature as that of a battery, recruiting difficulties are likely to occur.

The above is but a sketch, lacking in much detail and requiring adaptation to suit the needs and conditions of the various units throughout the Kingdom. Those who have to deal practically with the subject will do well to remember that it is not so much the system employed as the manner in which that system is carried out that will make all the difference.

Perfunctory work is of no value in a voluntarily enlisted force, probably not much in any.

An officer may quite easily attend stables daily for many trainings, and at the end of them, should he not have honestly studied his subject, be quite unfit to have charge of any portion of a mounted unit.

On the other hand, should he so study it, whether it be horse-mastership, manœuvre, or gunnery, it is astonishing what results he can obtain in a very much shorter time than would usually be considered necessary for an efficient training; but it cannot be done by merely looking on. *Fabricando fabri fimus.*

XVII.

(Continued.)

THE TRAINING OF THE TERRITORIAL FORCE.

C.—INFANTRY.

By CAPTAIN H. WATKINS GRUBB, Border Regt., Brigade-Major,
Middlesex Infantry Brigade.

AMOUNT OF TRAINING.

WHILE it must be admitted that a large number of the men of the Territorial Infantry do no more training than the legal minimum, it must at the same time be realized that the majority of the officers, a large percentage of the non-commissioned officers, and a certain number of the men devote a great deal more time to training than is actually required of them by law.

It is chiefly with a view of suggesting how the best results may be obtained from the time which "enthusiasts" of the Territorial Force are prepared to give to training, that this paper is written. If the maximum of instruction be given to these, it may be justly assumed that they in turn will be in a position to instruct and assist to the fullest extent possible those who, either from force of circumstances or from lack of enthusiasm, are only prepared to give up a minimum of time.

TIMELY DETAILED TRAINING PROGRAMMES.

In 99 cases out of every 100, members of the Territorial Force are obliged to make their military training subservient to their civil occupations. It is, therefore, of the utmost importance that detailed programmes of work showing dates should be published by commanders, from divisional to company, for each of the two training periods of the year. These programmes should be published in sufficient time to admit of all ranks being able to fit in their civil engagements so as not to clash with any lectures, courses, tours, camps, &c., which they may desire to attend. The writer wishes to lay particular stress upon the importance of timely warning, since, in the past, bad attendances at the various exercises have been chiefly

due to dates not having been announced soon enough. It is hardly too much to say that training programmes should be so arranged that at least three months' notice is given even to the most junior in rank.

SYSTEM, PERIODS, BOOKS.

It is sometimes argued that, owing to the conditions under which the Territorial Force is maintained, it cannot be trained on the same lines as the Regular Army. Some go so far as to say that the Territorial Force should have training manuals distinct from those of the Regular Army. It is quite true that the training of Territorial troops presents many more difficulties to be overcome than does the training of Regular troops, and it is also true that certain modifications are desirable in the arrangements. At the same time it must be remembered that war, the ultimate object of all military training, will be the same for all, and that what is considered to be necessary for Regulars to learn in preparation for war must be necessary for Territorials also. Territorial troops have a high standard to aim at, and while realizing that they can never, under existing conditions of service, attain to the efficiency of Regular troops, they must endeavour, by making the most of the opportunities available, to reach as near to the standard of Regulars as possible. Without a high standard to aim at ambition is stifled.

With regard to the plea for distinct training manuals, our present training manuals contain nothing but broad principles which have to be adapted to circumstances whether we be fighting in close or open, flat or hilly country. It is to the application of these principles to the most probable circumstances that the attention of Territorial officers, non-commissioned officers, and men must be directed. The necessity for uniformity of training with a view of obtaining uniformity of action in war must be constantly borne in mind. Regular and Territorial troops may have to fight side by side in war; and unless each of these parts of our Army is trained on the same lines, uniformity of action and co-operation cannot be expected at the critical moment. It is by means of method and careful forethought that the difficulties presented to the training of Territorial troops can be got over. The same system, the same principles, and the same books should be applied to their training as are applied to the training of Regulars, and, as far as practicable, the different stages of progressive training should take place at the same periods of the year.

TIMES AVAILABLE FOR TRAINING.

It has been stated that certain modifications of the system of training applied to Regulars are necessary for Territorials. Before proceeding further, it would be as well to consider the conditions of Territorial training which render these modifications necessary.

Whereas Regulars enjoy the advantages of continuous training day by day, the Territorials have to make the best use they can of a certain number of evenings, Saturday afternoons, and in special cases Sundays. The only continuous training for the Territorials is the 8 or 15 days' annual camp. The cry at once goes up: "How can the training of Territorial troops be progressive in these circumstances?" True, it cannot be as progressive as with the Regulars, but it can be progressive to a very great extent for the Territorial "enthusiasts," if, as has already been advocated, the programmes of work, particularly of battalion and company commanders, have been made out and published sufficiently long before.

The tendency in some units to train in fits and starts is most detrimental to efficiency. Many instances occur of members of the Territorial Force performing all their drills just before camp, of encouraging a lull after the annual training in camp, and of doing all their musketry just before the 31st October. It should be the aim and object of all ranks to stimulate an evenly distributed interest in military training throughout the Force over the whole year, utilizing evenings, Saturday afternoons, and Sundays, according to the definite pre-arranged programmes.

Training on Sundays has been referred to. It may not be out of place to reassure those readers who look upon patriotism exercised in the form of military training on those days as equivalent to breaches of the 4th Commandment. It is not intended to enter into the right or the wrong of the matter. Suffice it to say that in no case need the times arranged for training on Sundays clash with attendance at divine service.

ORGANIZATION TO FACILITATE TRAINING.

The question of the interior organization of battalions must be carefully considered with a view of facilitating training arrangements. Every endeavour should be made to place the command of companies in the hands of officers who live in the same localities as the men they command. In battalions which have scattered companies, this arrangement is not easy to make, since, although an officer on joining the Force may be posted to the local company of his battalion, yet sometimes on promotion to captain he must be placed to fill a vacancy in command of a company at some distance from his place of abode. The desirability of local officers is very great, and happy should that company be which is blessed with officers who, through living in the neighbourhood of the men they command, can keep in close touch with them in both their civil and military capacities.

The same remarks apply to non-commissioned officers, and it can only be left to commanding officers to adjust the organizations of their battalions in this respect to the best of their ability.

In many battalions section organization does not receive from company commanders the attention which its importance demands. Instances are not infrequent of non-commissioned officers being in command of men who are considerably their seniors in civil life. As long as human nature is as it is, it is extremely desirable both for discipline and training so to adjust the organizations of sections that seniors in military life are those who are also seniors in civil life. Having adjusted the posting of non-commissioned officers to sections to coincide with the principle advocated above, the remainder of the company should be arranged in sections in some manner to correspond with the civil employment of the men, either by localities, or nature of employment. It is not in the least essential to have all sections of exactly the same size. With regard to specialists, such as signallers and men of the machine-gun sections, it is hardly necessary to point out that these should be drawn for each battalion from a certain locality, and, if possible, from men of one firm. Enough has been written to bring to the notice of Territorial officers the importance of adjusting the organizations of battalions, companies, and sections with a view of facilitating arrangements for training to the best advantage in accordance with the local conditions of each case.

PLACES FOR TRAINING.

We now come to considerations as to the places where training can best be carried out. Firstly, we have to deal with training at times other than during the annual training in camp; secondly, with the selection of places for the annual training in camp.

With regard to times other than during the annual training in camp, as has already been stated, we have to arrange for :

- (a) Evening work.
- (b) Saturday and Sunday work.

As to evening work, nothing need be said about places for theoretical instruction in the form of evening classes and lectures, since there should never be any difficulty in arranging for these to be held at places accessible to all; but, as to practical instruction in the form of drills, there is in many cases room for improvement in respect of the places where such instruction is held. In many battalions all evening drills are held in the drill halls, even when ground is available in the neighbourhood for open-air work, and even when the days are long enough for work to be carried on out of doors. This is chiefly due on the part of all to a desire to avoid the public eye, and this desire is in turn due to a lack of confidence in themselves on the part of the officers and non-commissioned officers instructing. This lack of confidence is happily becoming less and less, owing to the increasing

knowledge which Territorial officers and non-commissioned officers are gaining, and it is hoped that, in the near future, no practical training will ever be given in drill halls when it is possible for the training to be carried on out of doors and continued even in the dusk.

With regard to Saturday and Sunday work we have to consider

- (a) Saturday afternoon parades.
- (b) Regimental exercises.
- (c) Week-end trainings.

In most battalions Saturday afternoon parades are arranged for and are well attended. They result in valuable instruction being given, and it would therefore be superfluous to enter into the matter in this paper.

Regimental exercises in the Territorial Force are usually carried out on Saturdays and Sundays, the officers of each battalion assembling at some hotel for the two days, and solving a series of simple tactical problems on the ground. The writer considers that all regimental exercises should be held in the vicinity of the war station of the battalion concerned. In most cases the war stations of battalions are some distance from the mobilization stations. On the occasions when regimental exercises are held, every opportunity should be afforded to officers to study the ground at and near the stations to which their battalions are to move in the event of war. It will be a considerable advantage to the Territorial Force if the officers know intimately the country over which they may be called upon to fight, and the practice of carrying out regimental exercises over this ground should be universal.

Week-end trainings or camps, as they are sometimes termed, are gradually becoming of more frequent occurrence throughout the Territorial Force, during both the individual and collective training periods. There is, however, often a difficulty as to where they can be held. In the opinion of the writer these week-end trainings should be held at the dépôts of Territorial battalions. It is most desirable that Territorial battalions should feel that they are part and parcel of a regiment composed of a dépôt, two or four Regular battalions, one or two Special Reserve battalions, and one or more Territorial battalions. The impetus for this feeling must come from the Regular portions of the regiment, and it is pleasing to see how, in a large number of regiments, the feeling of comradeship exists and is increasing. The attachment of Regular officers to Territorial units, and of Territorial officers to Regular units, has been productive of good fruit on both sides; but the officer who can do most to assist in the training of Territorial battalions is the officer commanding the dépôt. It is to this officer to whom commanding officers and brigadiers should look for assistance in making week-end trainings

a success. The question of accommodation at depôts is in most cases a matter of arrangement, and can usually be fitted in when a certain number of men at the dépôt are on furlough or, in larger numbers, when parties of Regular and Special Reserve recruits are away at a musketry camp. The circumstances of each dépôt differ so much that it is not possible to lay down exactly what arrangements can be made, but, if a good understanding exists between all units of a regiment and the staff of Territorial brigades, week-end trainings at depôts for non-commissioned officers, specialists, and company training can be held at a minimum of cost to the training grant. Before leaving the matter of week-end trainings at depôts the writer wishes to state that, in his opinion, it should be exceptional for Regular officers and non-commissioned officers on dépôt establishment to be asked to assist directly in the training of Territorial troops at these "week-ends." Responsibility for training must be thrown upon the Territorial officers and non-commissioned officers themselves, and the sooner they feel that this responsibility rests upon them alone, the sooner will they give up all the time they can to avail themselves of the many opportunities which they have of learning to be instructors in times of peace and leaders in time of war. The assistance of Regular officers should be confined to the giving of advice on methods of instruction, and in giving opinions as to the correctness or otherwise of the manner in which tactical principles are applied to various situations.

In considering the question of the locality for annual trainings in camp, it is necessary to bear in mind that under no circumstances should Territorial troops train in camps smaller than brigade camps. Battalions allotted as army troops should, for instance, invariably train with the brigade to which they are affiliated, so that brigade commanders can see that uniformity of training is maintained, and all ranks can be made to realize that every unit and formation is part and parcel of a larger whole. Exclusive of the London Divisions, all Territorial Divisions have been allotted to areas for war. In these areas infantry brigades have their war stations. It is in the vicinity of these war stations that the annual training in camp of Territorial brigades should be held every alternate year. It may be claimed that training areas are not always available in the vicinity of war stations. If this is the case, brigade camps should still be held within reach of the nearest available ground which can be obtained for training purposes. The advantages of a knowledge of the country at war stations have already been mentioned, and these advantages cannot be over-estimated.

It is advisable that divisional camps should be held once in every four years. Once every four years, also, infantry brigades should be encamped in the vicinity of stations where Regulars are quartered, with the object of allowing Territorials of all ranks to mix with

Regular troops. If this plan were adopted it would be to the mutual advantage of both Regulars and Territorials.

RANGES AND MUSKETRY.

Facilities for improving the musketry efficiency of Territorial troops are being increased to a very great extent. Miniature ranges exist at practically all drill halls, and additional open ranges are gradually being made. While admitting that shooting on miniature ranges is in every way desirable for recruits, it cannot be said that this form of musketry is of much use as training for war, when once the soldier has passed the recruit's stage. The distance that many have to travel to open ranges renders frequent practice on them somewhat difficult. With these facts in view it is necessary to find some additional means of giving to Territorial troops opportunities for practical musketry training. These means should be the provision of numerous 30-yard ranges, and it is hoped that County Associations will leave no stone unturned to provide ranges of this nature in close proximity to most drill halls. In the space available it is not possible to enlarge upon the merits of 30-yard ranges, but it is enough to say that on them troops can use the rifles they will use in war, that full charges of .303 ammunition can be fired, and that the practice afforded is most valuable as an addition to the very meagre course which, under present conditions, Territorial troops are called upon to carry out on the open range. The selection of sites for these ranges presents no difficulty as regards safety, and the only obstacle to be surmounted is to find suitable ground where the noise of firing does not cause inconvenience to dwelling-houses in the vicinity.

With regard to field firing, it is suggested that arrangements should be made for battalions to take all officers, non-commissioned officers, and specially selected men to some field firing range at Easter or Whitsuntide. On these occasions, simple individual field practices should be carried out first, to be followed by elementary collective field practices in the nature of exercises for sections in fire direction and the application of collective fire. If time permits, the instruction should conclude with demonstrations to show fire effect and vulnerability. Until greater musketry efficiency is apparent throughout the Territorial Force no attempt should be made in the programme of field practices to reproduce service conditions or to illustrate tactical principles. Should it be possible to carry out field practices during the annual training in camp, as well as at Easter and Whitsuntide, so much the better. Many battalions find that Easter and Whitsuntide are the best times for firing the machine-gun course, and it is urged that, whenever possible, machine-gun sections should be brigaded for this course.

It is now proposed to suggest how :

- (I) The individual training period ; and
- (II) The collective training period, should be employed.

I. THE INDIVIDUAL TRAINING PERIOD.

The individual training period must be considered under the following headings :—

- (a) Officers ; (b) Non-commissioned officers ; (c) Specialists ; and
- (d) Remainder.

(a) *Officers*.—In most battalions commanding officers arrange for a series of weekly or fortnightly lectures on the principles of manœuvre as set forth in Infantry Training and Field Service Regulations. These lectures should lead up to the regimental exercises in the form of officers' tours, to which reference has already been made. Two of these officers' tours should be held for each battalion during the individual training period. There has been a tendency in the past to formulate schemes of too elaborate a nature for these tours, and to give regimental officers tactical and administrative problems to solve, which, to say the least, would have been problems which in war would only fall to the lot of staff officers. Regimental officers' tours are in no sense staff tours, and, consequently, general and special ideas should be so framed that the problems set should, for the senior officers, deal only with one battalion, and, for the junior officers, with one or two companies.

During the latter half of the individual training period one or more officers' tours should be held under the direction of brigade commanders. Each of these brigade tours should be arranged for 12 senior officers of the brigade, and should be attended by Lieutenant-Colonels, Majors, and senior Captains only. The general and special ideas for these tours should be so framed that the problems set upon them do not, in any circumstances, deal with a mixed force larger than one squadron Yeomanry, one battery Royal Field Artillery, one section Field Company Royal Engineers, one brigade of infantry, and proportionately small Army Service Corps and medical units. These tours, like the regimental officers' tours, should be held in the vicinity of the brigade war station. Finally, at the conclusion of the individual training period, would come the divisional staff tour, to which it is unnecessary to make any reference here.

In addition to the above, two courses should be held under the orders of brigade commanders for captains and subalterns in preparation for their examinations for promotion and voluntary examinations. These courses should be held at some convenient centre on twenty-four days during the six weeks immediately prior to the dates of each of the two annual examinations. On three evenings in each week theoretical instruction should be given, and at the conclusion of each of these evenings, written questions or schemes should be

handed to the officers to solve at home and return for criticism. On the fourth occasion in each week instruction should be given on the Saturday afternoon. This instruction should take the form of a simple tactical scheme on the ground, dealing with the subjects upon which theoretical instruction has been given at the evening lectures during the week. A suggested syllabus of work for a course of this nature is given in Appendix A to this paper.

(b) *Non-commissioned officers.*—The non-commissioned officers of the Territorial Force have in the past been the recipients of a large amount of adverse criticism. In the opinion of the writer this criticism, though merited, is due not so much to the failings of the non-commissioned officers themselves as to the method, or rather lack of method, adopted to train them.

Do company commanders realize that, in order to obtain the best results from their work of training, their first care should be to instruct their non-commissioned officers to be in turn the instructors and leaders of the men?

It cannot be too strongly impressed upon all company officers that the instruction of non-commissioned officers individually in their duties as drill instructors, instructors in the field, and leaders of their men is of the utmost importance.

In addition to the actual work in the drill hall the instruction of non-commissioned officers during the individual training period should take the form of:

- (i) Informal "talks" or lectures either at the officer's own house or in some room at the drill hall.
- (ii) The solution of simple tactical problems on Saturday afternoons in the country without troops.
- (iii) Week-end trainings, for non-commissioned officers alone, at depôts.

The schemes on Saturday afternoons and at week-end trainings should take the form of a narrative, and it will be sufficient to limit the problems to the handling of a section, for instance, the action of an outpost picquet or the conduct of reconnoitring, flanking or other patrols.

If battalion courses for non-commissioned officers are arranged so much the better, but it must be distinctly understood that it is upon company commanders that responsibility rests for the training and efficiency of their non-commissioned officers.

In one of the Territorial Divisions company commanders are enjoined to set aside the first week in each month throughout the year to be devoted to classes for non-commissioned officers. If this plan were universally adopted, it is probable that the adverse criticism now levelled at Territorial non-commissioned officers would cease.

(c) *Specialists.*—In most battalions specialists, such as signallers and men of machine-gun sections, are, as far as possible, drawn in

each case from some particular locality in order to facilitate concentration for training. This plan is excellent, and its adoption has done much to increase efficiency. Specialists belong, in most cases, to the class described as "enthusiasts," and their training should be conducted on the same system as that advocated for non-commissioned officers. The whole of the time which specialists devote to military work throughout the year should be spent entirely in training to perform the particular work which they will be called upon to do as specialists in war. The writer has observed signallers, for instance, marching about behind their sections doing company drill. Without detracting from the importance of drill, it must be said that Territorial signallers could be better employed than in doing company drill.

Under the heading of specialists comes the question of scouts. The organization of scouts in the battalion is laid down in Infantry Training. In scattered battalions the training of battalion scouts in the field presents some difficulty during both the individual and collective training periods, owing to the distance which has to be traversed by some to concentrate. The suggested method of overcoming this difficulty is for the battalion scout officer to arrange for periodical single day scout musters on certain Saturdays or Sundays, at spots centrally situated. Scouts should be encouraged to arrive at the places of concentration on foot. The object of the training should be to provide a body of well-trained active men to act as scouts rather than a few "Burnhams." In Appendix B to this paper will be found a suggested syllabus of scout training; this syllabus is intended to cover specialist instruction only. In addition, it will, of course, be necessary to impart instruction in individual and collective infantry training.

Since the training of specialists is chiefly of an individual nature, their work, during the individual and collective training periods, does not differ to any great extent. At the same time, the necessity for co-operation between specialists and the troops they are to serve must receive attention as time advances towards the annual training in camp.

(d) *Remainder*.—The class of training which should be given to privates during the individual training period is sufficiently laid down in Infantry Training, that further reference to it is unnecessary in detail.

The writer would, however, like to emphasize the fact that a greater effort should be made throughout the Territorial Force to interest men in physical training and athletic exercises, particularly during the winter months. Some battalions are taking steps to start "Schools of Arms" with a view to encourage the practice of many sports. Concerts, whist drives, and dances at present receive the chief attention of entertainment committees. Would it not be

considerably to the advantage of our Citizen Force if some of the above forms of entertainment were varied by assaults-at-arms? However much science may improve material for war, man remains the same, and it is upon his physical condition that the result of wars depends to-day as much as in the past. It should, therefore, be the pride of every Territorial soldier to develop his physical powers, as well as his mental powers, and every opportunity should be given him to do so.

(II) THE COLLECTIVE TRAINING PERIOD.

Provided the training of officers, non-commissioned officers, specialists, and the private has been honestly and systematically carried out during the individual training period, the work of collective training will be considerably facilitated. But here we are confronted with the much vexed question of attendance. It is not within the scope of this paper to discuss whether or no Territorial troops should be paid for drills in order to obtain better attendances on days arranged for collective training. Under the present conditions of service we are dependent for attendances above the legal minimum on the personality of officers and non-commissioned officers, and on whether the drills are made interesting or not.

On the enthusiasm of Territorial officers and non-commissioned officers of the present day it is impossible to speak too highly, but there is a leaf in the matter of personality which they might well take from the book of Regulars. The writer refers to the relationship which exists between officers, non-commissioned officers, and men of the Territorial Force. The close touch which exists between officers, non-commissioned officers, and men in the Regular Army does not appear to exist in the ranks of the Territorial Force. Discipline must, of course, be maintained, but it is in no way derogatory to discipline for officers and non-commissioned officers to mix more with the men they command when off parade, and it is hoped that as time goes on Territorial officers and non-commissioned officers will realize that, the better they know their men both on and off parade, so much the easier will become their responsibilities for training.

With regard to making the drills interesting. It is frequently advocated by Territorial officers that they obtain the best attendances when the subject of instruction is company drill. The reason given is that the men prefer this to all other forms of training. The importance of drill for instilling discipline is very great, and the writer does not wish to say one word against it. For modern war, however, drill has its limitations, and greater efforts should be made on the part of all to render other forms of training equally attractive and interesting. The way to do this is for Territorial officers and non-commissioned officers so to study work in the field that they are competent, with knowledge at their fingers' ends, to make their

instruction in such matters as interesting as they now make their instruction in company drill, and to practice nothing which is not of a thoroughly practical nature in relation to war.

As in the Regular Army, so in the Territorial Force, collective training should start with section training under section commanders. In few battalions have section commanders in the past been called upon to carry out this portion of their duty, often on the plea that they are not competent to do so. Responsibility is usually accepted where it is thrown, and there is no reason to suppose that Territorial non-commissioned officers will be exceptions. The writer advocates that April and May should be devoted to section training and that, in addition to section drill as shown in *Infantry Training, 1911*, Sections 82 to 92 and 171, the men should be particularly instructed in such matters as fire discipline, the delivery of covering fire, rushes, reinforcing, assaulting, patrolling, scouting, use of ground, sentry work on outpost duty, maintaining connection as connecting files with an advanced guard, reporting and passing orders, entrenching, the maintenance of direction, the passing of ammunition from man to man, the delivery of a local counter-attack, visual training, and judging distance. Instruction should not be of a general character, but at each drill some particular point or points should be dealt with and mastered by all. Company training should be continued through June and July, and during at least the first seven days of the annual training in camp. As with section training, so with company training, instruction, when time is limited, should not be of a general character, but at each drill particular situations should be studied such as formations under artillery fire, formations under infantry fire, and similar matters. The writer does not propose to make any further remarks on the manner in which company training should be conducted except again to impress on company commanders the necessity for making out and adhering to a detailed programme of work, to refer them to *Infantry Training, 1911*, Section 172, and to bring to their notice the valuable paper on "Company Training," by General Haking published in the last issue of *THE ARMY REVIEW*.

It will be observed that the writer advocates at least seven days of the annual training in camp being devoted to company training; the remainder of the camp period, less one day, should then be available for battalion training. The last day of the annual camp it is proposed to devote to a brigade exercise.

Although Training and Manœuvre Regulations state that: "Brigade exercises should be exceptional," yet for the sake of impressing upon all ranks the need of co-operation in an army, the writer considers that at the annual training in camp one day devoted to a brigade exercise is well spent.

It is undoubtedly the case that Territorial battalions still look upon themselves too much as independent units and forget the fact

that one battalion must, not only in theory but also in practice, co-operate with another in the same way that one company co-operates with another.

CONCLUSION.

In conclusion, it must be said that the circumstances of some Territorial infantry, especially the London battalions, are such that some of the suggestions for training advocated in this paper cannot be given shape. In the case of these battalions a training grant in excess of the training grant allowed for the more favourably situated battalions is advocated to enable them to institute something in the nature of a permanent week-end camp where training may be carried out on systematic lines.

APPENDIX A.

SUGGESTED SYLLABUS OF COURSE FOR CAPTAINS AND SUBALTERN OFFICERS
(TERRITORIAL FORCE) BEFORE EXAMINATION "B," "Q," or "q."

Week.	Day.	Subject.	References.
First	1st	Fighting Troops and their Characteristics. Intercommunication and Orders. Field Fortification, Tools and their Employment	F.S.R. 1 to 21. I.T. 120 to 127. M.F.E. 1 to 17, 57 to 58.
	2nd	Military Law	
	3rd	Movements by Land and Sea. Information. Working Parties and their Tasks.	F.S.R. 22 to 44, 90 to 98. M.F.E. 18 to 23.
Second	4th	Reconnaissance Scheme	
	5th	Quarters, Billets, Camps and Bivouacs ...	F.S.R. 45 to 63. M.F.E. 56, 59 to 68.
	6th	Organization	
	7th	Advanced Guard. Flank Guard ...	F.S.R. 64 to 70.
Third	8th	Scheme for an Advanced Guard, involving selection of a Bivouac	
	9th	Rear Guard. Retirements. Demolitions without Explosives	F.S.R. 71 to 74. I.T. 148. 150. M.F.E. 113 to 114.
	10th	Organization	
	11th	Outposts	F.S.R. 75 to 89. M.F.E. 54.
Fourth	12th	Rear Guard and Outpost Scheme	
	13th	Attack	F.S.R. 99 to 106. I.T. 128 to 137.
	14th	Military Law	
	15th	Attack	F.S.R. 99 to 106. I.T. 128 to 137.
Fifth	16th	Attack Scheme	
	17th	Defence. Improvement of Field of Fire. Utilization of existing cover. Earthworks	F.S.R. 107 to 110. I.T. 138 to 147. M.F.E. 24 to 41.
	18th	Organization	
	19th	Defence. Obstacles	F.S.R. 107 to 110. I.T. 138 to 147. M.F.E. 42 to 50, 78.
	20th	Defence Scheme	

APPENDIX A—*continued*.

Week.	Day.	Subject.	References.
Sixth	21st	The Encounter Battle. Pursuit and Retreat. Fighting in close country. Ammunition supply	F.S.R. 111 to 113, 158 to 160. I.T. 149, 151 to 154, 167 to 169. M.F.E. 51 to 53, 55.
	22nd	Organization	
	23rd	Night Operations	F.S.R. 129 to 140 M.F.E. 74 to 77.
	24th	Visit to some place where specimens of Field Engineering Works can be shown	

NOTES.

F.S.R. Field Service Regulations, Part I.
 I.T. Infantry Training, 1911.
 M.F.E. Manual of Field Engineering, 1911.
 Numbers given in Column 4 refer to Sections.

APPENDIX B.

SUGGESTED SYLLABUS OF SCOUT TRAINING (TERRITORIAL FORCE).

(1). *Lectures should be given on :—*

- (a) Action of infantry scouts generally. (I.T. 175.)
- (b) Training of infantry scouts. (I.T. 174, i and ii.)
- (c) Organization of infantry scouts. (I.T. 174, 3.)
- (d) Matters enumerated in (9).
- (e) Organization, uniform, and strength of units of all arms in the principal Continental armies.

(2). *Elementary instruction in map reading* (references are to the Manual of Map Reading and Field Sketching) :—

- (a) Definitions of topographical forms. (Ch. II, 6.)
- (b) What is meant by the scale of a map. (Ch. III, 8.)
- (c) Explanation of the usual conventional signs used. (Ch. IV.)
- (d) Explanation of the usual methods employed to show hill features on a map. (Ch. V.)
- (e) Use of maps in the field. (Ch. VI, 21 to 23.)
- (f) Explanation of true and magnetic meridian, also definition of a "bearing." (Ch. II, 7, and Ch. VI, 24.)
- (g) How to "set" a map. (Ch. VI, 25.)

(3). *Map reading on the ground :—*

Carry out the exercises recommended in the Manual of Map Reading and Field Sketching. (Ch. VI, 26 to 28, and Appendix V.)

- (4). *Visual training*
- (5). *Judging distance* { As advocated in Notes on Visual Training and Judging Distance, by Q.S.S.I. Bostock. (Price 6d.)

(6). *Semaphore signalling.*

- (7). *Rules regarding reports and messages.* (I.T., Ch. 127, Sec. 5, 6, 7, and F.S.R., Pt. I, Sec. 9, 15, and 16.)

(8). *Physical training* (Manual of Physical Training.) :—

- (a) Long-distance walking and running in ordinary clothes.
- (b) Breathing, trunk, arm, leg, neck, abdominal, and dorsal exercises.
- (c) Football players and other athletes should be encouraged to take up scouting, and one of each pair of scouts should, if possible, be a trained runner.

(9). *Practical instruction* (both individual and collective) must be given in the following exercises in addition to those enumerated in I.T., Sec. 174, 2 :—

- (a) Covering the advance of a company during the early stages of a battle.
- (b) Acting as scouts sent out from an advanced guard, either to the front or to the flanks.
- (c) Acting as a reconnoitring patrol from a picquet on outpost duty.
- (d) Acting as scouts left by a rearguard.
- (e) Acting as scouts left to cover a retirement.
- (f) Receiving, carrying and delivering a verbal or written message.
- (g) Finding the way back to a point from which a start was made.
- (h) Remembering ground once passed over and thus training to act as guide.
- (j) Training in power of observation. (The Scout Officer should go over the tract of country, or routes selected for the exercise, and make notes of all he observes. Each scout on reaching the appointed rendezvous should be questioned separately as to the points which should have been noted by him *en route*.)

At each exercise one or more of the lessons indicated in I.T., Sec. 174, para. 2, and in the above headings, should be thoroughly taught.

XVIII.

MEMORANDUM BY THE DEPARTMENT OF DEFENCE, UNION OF SOUTH AFRICA, EXPLANA- TORY OF THE SOUTH AFRICAN DEFENCE BILL, AS PUBLISHED IN THE *GAZETTE*, NOVEMBER, 1911.¹

Introductory.

A DEFENCE system for the Union of South Africa is formulated on broad lines in the Bill. This memorandum is issued simultaneously with the first publication of the Bill in the *Gazette*, in order to assist the people of South Africa in obtaining a correct appreciation of the defence system which the Union Government intend to submit for the approval of Parliament.

Though the form of a law does not lend itself readily to presenting clearly the principal features of a structure so full of detail as a national organization for defence, it will be seen that the Bill is so cast that it is not difficult to grasp at once the essential features of the scheme.

THE FUNDAMENTAL PRINCIPLES OF THE SYSTEM.

(CHAPTER I.)

Liability to War Service.

2. In the first chapter of nine sections are laid down the main principles underlying the scheme. Thus the first section enunciates the principle, recognized and accepted by the people of South Africa from the earliest times, of every citizen's liability to assist in the defence of his country. In attaining the high status of a self-governing State of the Empire, South Africa has achieved a position which compels her to assume a responsibility for her own defence, a responsibility hitherto shared to a large extent by the Imperial Government. It does not therefore now suffice merely to recognize in theory the liability of every citizen to defend his country in time of grave danger. The Union must insure itself in time of peace against the

¹ Published at the Government Printing and Stationery Office, Pretoria, 1911.

danger of war by arranging a proper and efficient organization for defence, and, if that danger actually arises, the Union must be able to meet it successfully with the least possible damage and loss.

Training.

3. To train the whole population for military purposes would create a greater force than the country would reasonably require to defend it, would impose too heavy a financial burden on the country, and would probably not lead to efficiency. It is therefore proposed to train annually only such a number of citizens as seems reasonably required for defence purposes, and to let the Government from time to time fix this number in accordance with the probable requirements and financial resources of the Union.

With this object clearly in view the first chapter of the Bill proceeds to make provision whereby as many citizens as are required to form a properly organized defence force can be given an adequate military training (section *two*).

The military training must be given at an age and under conditions which offer the best possible results in securing a proper standard of discipline and military efficiency, and at the same time interfere to the least possible extent with the every-day professional, business, industrial, or agricultural vocations of citizens.

To fulfil these requirements, the period of training has been selected as four years, to be carried out between the ages of seventeen and twenty-five.

The details of the course of training will vary in the different branches of the forces, but the following may serve to give a general idea of the course :—

- (a) The course will start with an efficient recruit training. Recruits will perform as many day and night drills as may be necessary to fit them for the ranks.
- (b) After the recruit course the whole force will annually undergo a period of continuous training varying from eight to fifteen days in the different arms, and will fire an annual course of musketry.
- (c) The time of year at which the continuous training will take place will be arranged in each locality with special regard to the seasons and general convenience.
- (d) Mounted troops will perform almost the whole of their training continuously in camps, but trained men of other arms will have to perform a certain number of day drills throughout the year.
- (e) Certain days only will be set apart for day drills and will be arranged so as to ensure a full attendance of the unit concerned on each occasion.

Rifle Associations.

4. Those citizens who do not undergo military training will at least be given the opportunity to learn to shoot, so that no able-bodied citizen shall be without a proper knowledge of how to use a rifle. For this purpose a system of rifle associations will be provided, to which the Government will give the necessary ammunition grants and which will be accorded great latitude in providing for their own organization.

Contribution in lieu of Training.

5. It must be evident that the burden imposed on those citizens who are trained for military purposes will be much greater than on those who merely learn to shoot in the rifle associations. It is therefore proposed to throw another burden on citizens who do not receive the four years' military training, by providing that they shall have to pay a money contribution. In this way every citizen will contribute to the defence of the country, either by making himself efficient to serve his country to the best advantage in time of war, or by making an annual payment of £1 a year for twenty-four years (section *one hundred and fourteen*), and merely acquiring a fair knowledge of how to use a rifle.

It should be pointed out that a citizen cannot *choose* to avoid military training by offering to pay the money contribution, because, as will be explained later, the ballot may be resorted to to provide the number of citizens required for training as settled by the Government, and if an able-bodied citizen is balloted for, he is obliged to undergo the four years' training in any case.

The principle of a contribution in lieu of service is taken from the Swiss system, which provides for perhaps the most satisfactory citizen defence organization ever yet established, and which has to some extent served as a model for the present scheme.

Cadets.

6. The conditions in South Africa, *e.g.*, in rural districts with scattered farm schools, being such that it is impracticable to apply an efficient system of universal cadet training, the Bill (section *six*) provides for compulsory cadet training only where it can be carried out efficiently. Proof of satisfactory cadet training will absolve a citizen from certain recruit training (section *sixty-nine*).

Other Provisions of Chapter I.

7. Other sections of the first chapter make provision for the following matters :—

- (1) For allowing citizens to undergo naval training and to perform naval war service as reservists to the Royal Navy instead of military training and service (section *five*).

- (2) For excluding coloured persons from war service in a combatant capacity and from peace training or money contribution (section *seven*).
- (3) For laying upon employers the duty of giving citizens in their employ proper facilities to perform the training or service required of them (section *eight*).
- (4) For debarring persons of bad character from serving in the defence forces (section *nine*).

THE ORGANIZATION OF THE DEFENCE FORCES.

(CHAPTER II.)

The Requirements of Defence Organization in South Africa.

8. The first chapter having dealt with general principles, the next chapter deals with the organization designed to give effect to those principles.

It constitutes the defence forces of the Union and lays down the composition and functions of each part of those forces. It provides for the division of the defence forces into the Permanent Force, the Coast Garrison Force, the Active Citizen Force, the Royal Naval Volunteer Reserve, and for certain reserves to those forces. In order to understand this arrangement, it will be well briefly to consider here what are the actual defence requirements of South Africa. These requirements may be stated as follows :—

A trained citizen force of such numbers and so organized that a formidable and effective army can be put into the field before any danger can seriously menace the peace of South Africa. This force should constitute the First Line of defence.

The first line must be capable of being heavily reinforced by trained citizen reserves. These should constitute the Second Line of defence.

In an extremity all able-bodied citizens should be brought into service as a national reserve, constituting the Third Line of defence.

It is, however, necessary in South Africa to supplement the first line in two important particulars : (a) by providing for a small nucleus of permanent forces, and (b) by making special provision for the defence of defended South African ports.

(a) A small permanent paid force is required for three purposes :—

Firstly, to provide a small but highly efficient and easily mobilized body of troops, which, without any dislocation of public and private business, can be rapidly moved to any spot where violence and disorder is threatened. This can be organized from the present mounted police forces into regiments called the South African Mounted Riflemen. They

should continue to do police duty in time of peace, but should also be trained for military purposes.

Secondly, to furnish a highly efficient professional body of South Africans who will form the permanent administrative and instructional staff of the citizen forces. This is practically a new but a most important feature in South African defence.

Thirdly, to furnish a small number of complete units of artillery, an arm which depends for its utility in war on the maintenance of the highest standard of military efficiency. With a small number of these permanent artillery units trained to the highest standard, it is hoped to form a nucleus by intimate association with which a satisfactory standard of efficiency can be reached in artillery units of the citizen forces. The artillery batteries will be incorporated in the South African Mounted Riflemen in the same way as the present organization of the Cape Mounted Riflemen provides for a battery of artillery.

- (b) While the main defence of the South African coast line and the security of South African shipping routes must necessarily rest with the maintenance of sea-power by the British Navy, provision must be made for the military defence of the most important of the Union harbours. For this purpose it is necessary to have a special force (the Coast Garrison Force) whose duty it will be to provide adequately for coast defence.

The Organization Designed to Fulfil those Requirements.

9. Having thus briefly stated the defence requirements of the Union it is easy to follow the proposals set out in Chapter II of the Bill for fulfilling those requirements.

The Active Citizen Force, supplemented by the Permanent Force and the Coast Garrison Force, is designed to form the first line of defence; the Citizen Force Reserve, the second line; the National Reserve, the third line. The other divisions of the defence forces are:

The Royal Naval Volunteer Reserve.

Special Reserves (namely, Reserve of Officers, Field Reserve, and Police Reserve).

The following points may be noted in dealing with these divisions individually:—

A.—The Permanent Force (sections eleven and twelve).

Five regiments of South African Mounted Riflemen will be formed, one regiment by the incorporation of the Cape Mounted Riflemen, another from the mounted police forces in the Cape, a third from the mounted police forces in Natal, a fourth similarly in Transvaal, and a fifth in the Free State.

To each regiment will be allotted a rural or "frontier district" area, in which it will be responsible for carrying out the ordinary police duties of that area just as they are now carried out [section *twenty-five* (1)].

The total strength of these regiments of South African Mounted Riflemen will be some 2,500.

In addition, a corps of officers and non-commissioned officers to act as the instructional and administrative staff of the citizen forces will be formed, at first in small numbers only, but expanding subsequently with the development of the defence organization.

The efficiency of the whole of the defence forces will depend upon securing the most thoroughly competent officers and non-commissioned officers for the Permanent Force. While there is at present available in South Africa much valuable material from which to select and train a staff to the highest possible standard of military proficiency, provision for the maintenance of that high standard is found later in the Bill by the establishment of a South African Military College. Ultimately, the officers of the Permanent Force will as far as possible be selected from graduates of that college.

In other respects the functions of the Permanent Force have been sufficiently indicated for the purpose of this memorandum.

B.—Reserves for the Permanent Force (section twenty-four).

Two reserves are provided for, each with distinct and separate functions, viz. :—

The Field Reserve, consisting of ex-members of the South African Mounted Riflemen and specially selected citizens who have received military training in the Active Citizen Force, and who voluntarily agree to serve in the Field Reserve in time of war, and thus maintain the regiments of South African Mounted Riflemen at full strength in the field.

The Police Reserve, consisting of specially selected citizens of Class "B" of the Citizen Force Reserve who, living in the districts policed by the South African Mounted Riflemen, will undertake to assume the police duties of any portion of the South African Mounted Riflemen taken from their district and mobilized for service. This provision simply places on a general and organized basis a practice which for many years has been in partial operation in several parts of South Africa.

C.—The Coast Garrison Force (sections thirteen to fifteen).

South Africa is now the only self-governing dominion in the British Empire which does not herself make full provision for the local defence of her own harbours. The Bill gives the necessary power to make that full provision.

Coast defence work is of a highly technical nature, requiring long training to use the complicated machinery and appliances needed.

Without constant care, attention, and inspection, the gun-mountings, ammunition, electric appliances, &c., deteriorate rapidly, and experts are required for their proper maintenance. Until these experts can be provided from South Africa the most economical and efficient method will be to obtain them from the United Kingdom, and the necessary provision is made in the Bill for carrying out this system, if practicable.

While a small force of experts is required it is not necessary that the whole garrison of a coast fortress shall be maintained on a permanent footing. The cost of such a system would be prohibitive. It is therefore proposed to continue the plan now in force at Table Bay, where the Cape Garrison Artillery supplements the Royal Garrison Artillery, and to extend this system also to Durban.

To work the guns of the coast defences the Bill provides for the establishment of a corps of *South African Garrison Artillery* of which the existing Cape Garrison Artillery will form the first division.

For other technical work in connection with coast defence such as the work of engineers, electric light, signalling, telegraphy, harbour control, &c., the Bill provides for the establishment of a *South African Coast Defence Corps*, and such other corps as may be required.

Provision is made for the members of these technical corps to receive daily pay for such periods as may be prescribed, and provision is also made for their equipment, clothing, &c.

These corps will only provide against attack from the sea, but experience warns us to expect that the most formidable form of attack against coast fortresses will sometimes be made by forces landed for their capture. It will therefore be necessary to provide infantry and perhaps other mobile forces to assist in their defence. It is proposed both on the Cape Peninsula and at Durban to employ a portion of the Active Citizen (field) Force referred to below for this purpose.

Officers for the Coast Garrison Force, so far as may be possible with due regard to technical requirements, will be obtained through the ranks or from cadets at the proposed military college. Powers are taken, however, to grant commissioned rank to any citizen whose professional attainments or position in his civil calling specially fit him for service in the coast defence forces.

D.—*The Citizen Force* (sections sixteen to twenty).

This is the main force on which the Union must rely for its defence. Its organization falls naturally into three lines :

- The Active Citizen Force.
- The Citizen Force Reserve.
- The National Reserve.

The Active Citizen Force will consist of citizens between the ages of seventeen and twenty-five undergoing their four years' peace training, commanded by citizens who have duly qualified themselves and who will engage to serve for not less than twelve years as officers of the force, and by other citizens who are selected and agree to continue their service in the force after the age of twenty-five as senior non-commissioned officers (section *seventeen*).

The force will have a territorial organization and, when the whole system is in full working order, each district will be able to furnish its quota of mounted troops, artillery, infantry, engineers, or departmental services, according to the nature and circumstances of its population (section *eighteen*).

So far as present conditions enable a correct opinion to be formed, a sufficient strength for the Active Citizen Force would be 20,000 to 25,000 men, but probably this number would only be gradually attained.

The Citizen Force Reserve will consist of citizens between twenty-one and forty-five years of age, and be divided into two classes, "A" and "B"; the distinction between the two classes being that Class "A" will consist of citizens who have received a military training, while Class "B" will provide for able-bodied citizens who have not received that training, but have learnt to use a rifle, and can therefore give effective assistance if necessary. No compulsory training is required of members of either class of the Citizen Force Reserve, but they may attend training if they wish to do so, and are in any case to be specially encouraged to keep up their rifle shooting by joining rifle associations (section *nineteen*).

The National Reserve provides for a very grave emergency, in which every citizen between the ages of seventeen and sixty might be required to assist in some way to preserve the integrity of the Union (section *twenty*).

E.—*The Royal Naval Volunteer Reserve* (sections *twenty-one* and *twenty-two*).

As is indicated by the name of this reserve and by a previous allusion in this memorandum to naval service, the Bill does not seek to create a local navy in any shape or form. It merely provides one form of assistance to the Royal Navy of Great Britain by creating an organization under which citizens who prefer naval to military service may voluntarily enter and be trained as reservists for the Royal Navy instead of being entered for and trained with the military defence forces of the Union.

A nucleus for this new organization already exists in the Naval Volunteer Corps at Capetown and Durban.

F.—*Officers' Reserve* (section *twenty-three*).

Provision is made for retaining as officers and having ready for an emergency the services of citizens with war experience or training.

TRANSITION FROM EXISTING ARRANGEMENTS.

(CHAPTER III.)

Administration.

10. Sections *twenty-five* to *forty* of Chapter III deal with a number of details of administration which, though important in themselves, do not at the present stage of this memorandum appear to call for individual notice. Some of them will be referred to later on when dealing with Chapter IV. The remaining sections *forty-one* to *forty-six* of Chapter III show exactly how it is proposed to amalgamate the existing separate defence organizations of the four Provinces into the Union defence system.

Permanent Police Defence Forces.

11. In every part of South Africa which is now comprised in the Union, the Government, whether British or Republican, have always recognized in principle the necessity and utility of organizing their civil police forces, so that these forces should have some degree of military training and should be available for defence purposes in time of war.

The establishment of the Union does not alter this principle fundamentally, but enables better and more logical effect to be given to it.

The functions of police in towns and districts closely populated by Europeans are very different to those of police charged with preserving order in the frontier or rural districts where the population is sparse or comprises a large preponderance of natives.

The policing of these rural or frontier districts requires from the men entrusted therewith almost all those special qualities which are most effective in warfare. No South African Government could afford to lose the splendid material thus obtained in police work, when a force for actual warfare is required. Whereas before Union it was difficult in the smaller of the four separate Colonies to divide the police forces so as to assign to one portion special military functions in time of emergency and to give that portion a fully adequate preparatory training, it is now possible under Union to make that division, and to organize all the existing police forces into two portions: the one a purely civilian force for the policing of towns and closely settled districts; the other a military police force on lines which the work of the Cape Mounted Riflemen for many years has proved to be successful in the Cape Colony, and which for the first

five years after the war were also followed in the Transvaal and Orange River Colony.

To carry out this division of the present police forces, another Bill, the Police Bill, is published simultaneously with the Defence Bill. This Police Bill creates a force of South African Police which is to be the purely civilian police force on whom rests no responsibility for military defence.

The Defence Bill (section *forty-one*) provides for the incorporation in the Permanent Force, *i.e.*, the military police force, of those members of existing police forces whose employment in rural areas makes them suitable for service in the Permanent Force, while the members of existing police forces, who are in fact doing town police work or kindred police work, will be allocated to the South African Police.

The proposal therefore in no way involves any radical change. It merely seeks to reorganize the police forces under a system which definitely accepts and carries to its logical conclusion the real distinction between the two kinds of police forces, a distinction which at present actually exists but is not adequately recognized.

Section *forty-two* provides the same safeguards for the rights of members of existing police forces as were recommended by the Select Committee of Parliament during last session.

Militia and Volunteer Corps.

12. The volunteer system on which South African Colonies under the British Crown have hitherto mainly relied for putting a considerable armed force in the field, is in some important respects incompatible with the system designed in the Bill. The administrative and financial difficulties of maintaining the two systems side by side are for practical purposes insuperable. At the same time the good public service which has been rendered by militia and volunteer corps is freely recognized. Many of these corps have served with distinction in various campaigns, and it is specially desired to find a place for the traditions and associations of the principal of these corps in the new organization.

With that object in view, it is proposed to invite members of those corps to transfer at least a reasonable proportion of their existing strength to the Active Citizen Force, retaining for the corps its title and associations by its embodiment in the Active Citizen Force on these terms, and on the further condition that a proportion of citizens liable for training under the new system enter themselves voluntarily for service in that corps at the date of embodiment.

While members of militia and volunteer corps are only required to engage for twelve months in the corps from the date of its embodiment, it is hoped that the *esprit de corps* and the keen interest in military work which have hitherto played so important a part in militia and volunteer corps will induce those who are willing to serve

and are suitable for service to continue their active connection with the corps after the first twelve months.

The provision for this amalgamation is contained in section *forty-three*.

Cape Garrison Artillery.

13. The volunteer corps of Cape Garrison Artillery is dealt with specially in section *forty-six*. Practically, it will continue to serve on very much the same lines as at present, though probably an increased amount of training will be required of members. Section *thirteen* (2) provides for the incorporation of the corps in the Coast Garrison Force.

THE TRAINING OF OFFICERS AND MEN OF THE DEFENCE FORCES.

(CHAPTER IV.)

Preliminary.

14. Under this head it will be convenient to describe in outline the machinery devised in the Bill for the recruitment, instruction, and training of the various portions of the defence forces.

Military Districts.

15. For defence purposes the Union will be divided into military districts, and to each district there will be assigned the number of units (corps) of such arms and departmental services as it can conveniently carry [section *twenty-five* (3)]. For the first year of the new scheme's operation, it will not be possible to carry out this scheme in its entirety. The initial division of the Union into districts and the assignment of units to districts will apply to those areas which now furnish the principal militia or volunteer corps. As has already been explained, it is hoped to embody most of these corps in the Active Citizen Force. The extension of the scheme to other districts will be pushed forward with all possible despatch.

District Officers and Adjutants—Duties of.

16. Each military district will be placed under the charge of a staff officer of the instructional and administrative staff, and these district officers will be responsible for the military organization of their districts, and for supervising the military instruction given in their districts. Thus, as will appear later on, they will be charged with the registration of all citizens liable for training, the entering of citizens for training whether voluntarily or by ballot, the organization of units of the Active Citizen Force, the organization of rifle associations, the rifle training and practice in those associations, and the organization and training of cadets. In addition, each district officer will act as brigade-major (chief staff officer) of the troops of his district when assembled in camp or when taking the field on active service.

District officers will also be required to give special attention to the individual training in professional subjects of citizen officers and non-commissioned officers of their districts by arranging for them special local courses of instruction and lectures in the higher branches of military study.

For the larger combatant units, *e.g.*, a mounted regiment or a battalion of infantry, it will be necessary to have adjutants whose chief duty will be to deal with the internal organization and training of their units, but these officers will also give general assistance to the district officer of their district.

A small subordinate instructional and clerical staff will be allocated to each district for duty under the district officer or adjutants, as may be necessary.

It will thus be seen that very wide and important responsibilities will rest on the district officer and his staff, for although citizen officers will be in actual command of the various units, it cannot be expected that the latter will be able to give the constant attention to the details of administration and training which alone can secure the military efficiency of the district.

Selection and Training of District Officers and Adjutants.

17. As soon as the Bill becomes law it is proposed to establish a special class of instruction lasting six months for officers and others with special military and administrative aptitude, training, and experience, and from this class to select the individuals who have shown themselves to be most suitable for appointment to the important positions of district officers and adjutants. With the development of the system, additional district officers and adjutants will be required, and these will have to be selected by a similar process.

Military College.

18. While the defence conditions of South Africa are in such an early state of development, it will probably be premature to attempt to establish at once a military college for cadets on the elaborate scale of Kingston in Canada, West Point in the United States of America, or the most recently established military college at Canberra in Australia.

If, however, South Africa is to maintain defence forces worthy of her place in the world, she must recognize the primary importance of making proper provision for the instruction and training of those of her citizens on whom will fall the grave responsibility of military leadership. The high qualities requisite for successful military leadership in time of war are not attained merely by acquiring professional knowledge of military subjects. They depend very largely upon character trained to habits of discipline, self-control, and organization. In the absence of extensive war experience, the training of character

in those habits can hardly be achieved except by such an institution as a military college, where youths are taken and specially trained from an age at which their characters are most susceptible to the acquisition of those special qualities.

The Bill therefore seeks power for the establishment of a South African military college (section *forty-seven*), but in the initial stages of developing a defence system it is not proposed to embark upon the establishment of a costly and elaborate institution on the lines adopted elsewhere. The nucleus of an ultimate institution which could properly be styled a South African military college, will be formed by one or more centralized schools of instruction at which officers and others will receive special courses of instruction in the various branches of the military profession.

Registration.

19. Seeing that the Bill provides that any citizen between the ages of seventeen and twenty-five may be required to undergo a course of military training spread over four continuous years, it is necessary to provide the machinery whereby effect may be given to that principle.

It is clear that this four years' course must begin not later than in the calendar year in which a citizen attains the age of twenty-one ; and also that it may begin in any one of the four years before that.

When the Bill becomes law, it will therefore be necessary to know how many citizens there are in each district between the ages of seventeen and twenty-one during the first year of the Act's operation, and how many will attain the age of seventeen in the second and every subsequent year.

This information is obtained by requiring all citizens of those ages to register themselves in each military district during the month of January (section *fifty*).

Assuming that the year 1913 will be the first year of the Act's operation, every citizen who in that year attains the age of seventeen, eighteen, nineteen, twenty, or twenty-one will be required to register himself at the office of the District Officer of his district in January. In January, 1914, every citizen who in that year attains the age of seventeen will be required to register himself similarly.

The effect of the proposed system subsequent to registration can best be illustrated by giving an example of an individual case :—

Voluntary Entry.

20. Upon registration in January, 1913, a citizen attaining the age of seventeen during that year has these three alternative courses open to him.

The First Alternative : To enter voluntarily at once for four years' peace training in the Active Citizen Force.

He is then allotted to a suitable corps and his four years' training are reckoned from the 1st July, 1913, to the 30th June, 1917, when he will be twenty-one years of age or thereabouts. Thereafter he becomes a member of Class "A" of the Citizen Force Reserve with liability for war service, but no liability for further training and no liability for the money contribution of £1 a year.

The Second Alternative : To defer entering voluntarily for peace training for another one, two, three, or four years.

Although at liberty to defer for four years his voluntary entry for peace training, he will be liable during each of those years to be drawn by ballot for that training. Whether he enters voluntarily or is drawn by ballot for peace training in or before his twenty-first year, at the end of the four years' training he would be in the same position as if he had accepted the first alternative.

The Third Alternative : To avoid military training if possible.

He then must serve for four years from the 1st July in his twenty-first year in a rifle association, and thereafter become a member of Class "B" of the Citizen Force Reserve with liability for war service, and an actual obligation to pay the annual money contribution of £1 a year for twenty-four years from his twenty-first year. In addition to this he must take his chance of being drawn by ballot during June in 1913, or again in one or other of the four subsequent years, and thus be compelled to undergo a four years' course of military training. If, however, he were drawn by ballot he would be in the same position at the end of his four years' training as if he had accepted the first alternative.

The Ballot.

21. There are good grounds for hoping that it will never or very rarely be necessary to have recourse to compulsion in obtaining a sufficient number of citizens to fit themselves for service in defence of the Union and maintain the Active Citizen Force at a strength adequate for the needs of South Africa. It is not, however, practicable to frame a defence system on this expectation, and the Bill therefore provides for the introduction when necessary of a special system of selection by ballot if the number of citizens who enter voluntarily for military training should prove to be inadequate.

The obvious objection to a ballot system is that it is haphazard, and its operation, therefore, is almost certain to inflict exceptional disabilities on particular individuals while relieving other individuals of obligations which they are in a position but unwilling to fulfil.

The special ballot system, for which provision is made in sections *fifty-three* to *fifty-six* of the Bill, seeks to minimize this disadvantage in the following manner :—

The names of all citizens in a military district between the ages of seventeen and twenty-one will be divided by the registering officer (who usually will be the district officer) into three classes according to the means and circumstances of their livelihood.

The registering officer, by his intimate knowledge of his district and by careful inquiries in each individual case, will be able to ascertain with a good deal of accuracy what those means and circumstances actually are.

In the first class, or on the first provisional roll, he will place those who should find no difficulty in undergoing four years' training in the Active Citizen Force, *e.g.*, men receiving a good salary or earning an adequate income, and able to get away for regular or occasional holidays.

On the second roll he will place those who will find it less easy to undergo that training, *e.g.*, men drawing small salaries or making a bare living, with few opportunities for getting away, or having special domestic ties.

On the third roll he will place those who will find a real difficulty in giving up the time required for the training, *e.g.*, daily paid artisans and labourers.

These rolls having been framed for a district, the shortage of numbers in that district to be made good by ballot is notified by the Government, and after that notification a local revising court is appointed to revise the rolls and hear objections. When those objections are disposed of, the rolls become final, and in June the ballot is held by drawing from the rolls in sequence, first exhausting the numbers on the first roll, then the second roll, and finally the third roll.

The sections (*fifty-three* to *fifty-six*) dealing with this should be read carefully if a more complete idea of the system is required.

Horse Allowance and Insurance.

22. In paragraph 3 of this memorandum an outline of the proposed course of training has already been given. The power to prescribe the course is taken in section *sixty-one*. Here it is only necessary to add a word about the mounted men. In a country like South Africa with wide spaces and long distances, the mounted man is for military purposes much more useful than the dismounted man ; and the Bill encourages citizens in several ways to come forward with their own horses. A citizen who desires to join a mounted corps should bring a serviceable horse, saddle, and bridle with him when he comes out for training. In return for this he will be given an

annual allowance in cash of an amount which will be determined by regulation. In addition the Government compensates him for loss of or injury to his horse on military service, and is to pay £1 10s. annually towards insuring his horse against death or injury when it is not being used for military work (sections *sixty-two* and *sixty-three*). Rations and forage will be supplied at the public expense to citizens when they come out for continuous camp.

Rifle Associations.

23. Rifle associations are to be a marked feature of the system as has been indicated earlier in this memorandum (paragraph 4), and by this means it is sought to secure that the large surplus of citizens who do not receive a four years' military training will be encouraged to maintain the high standard of skill with the rifle for which the people of South Africa have always held a so deservedly high reputation, while citizens who have finished their military training will have an easy and pleasurable opportunity of keeping up and improving their shooting.

Sections *sixty-five* to *sixty-seven* deal specifically with the very simple organization required for these bodies.

Cadets.

24. The sections dealing in detail with cadet training (*sixty-eight* to *seventy-three*) do not require special notice as their provisions in the main follow lines already well-established in most parts of South Africa, and in paragraph 6 of this memorandum the extent to which the cadet system is to be applicable under the proposed new system has already been indicated.

SERVICE IN TIME OF WAR.

(CHAPTER V.)

25. The main provisions of this short chapter of eight sections (*seventy-four* to *eighty-one*) are as follows :—

The Permanent Force can at all times be called out for the prevention or suppression of internal disorder within the Union or for active service against an enemy within or beyond its borders. The citizen forces (Coast Garrison Force, Active Citizen Force, and Citizen Force Reserve, Classes "A" and "B") can be called out for prevention or suppression of internal disorder within the Union, and in time of war for active service anywhere in South Africa. The National Reserve may only be called out in time of war when the other forces have been utilized.

If Parliament is not sitting when the citizen forces are called out in war time, it must be summoned to meet as soon as possible, and not later than 30 days from the issue of the Proclamation.

Exemptions from war service are provided for by section *eighty* for members and officers of Parliament, judicial officers, ministers of religion, and others.

SPECIAL POWERS IN RELATION TO DEFENCE.

(CHAPTER VI.)

26. In this chapter are contained several provisions of the nature indicated in the heading, the most important of them providing for :—

The security of defended ports (section *eighty-three*).

Powers of commandeering in war time (section *eighty-four*).

Secrecy in warlike operations and preparations for war (sections *eighty-nine* and *ninety*).

Prevention of illicit dealing in warlike stores (section *ninety-two*).

DISCIPLINE, OFFENCES, AND LEGAL PROCEDURE.

(CHAPTER VII.)

27. In this chapter provision is made for the special codes of discipline, special offences, penalties, and procedure which it is necessary to lay down for the proper conduct of the proposed defence organization. In borrowing the military code of the United Kingdom and adapting it to South African requirements, it has been possible to secure the adoption of a code framed on the experience of many years, and one which, while providing in careful detail for the many and varying contingencies connected with military service, at the same time jealously safeguards individual liberty and the proper working of justice. It should be clearly understood that while all members of the defence forces are to be subject to the military code in relation to their service with those forces, in time of peace the *ordinary civil courts alone* can punish with fine or imprisonment an infringement of that code by a member of the citizen forces. It may, therefore, be stated that while the basis of the existing laws of the late Colonies on this subject has been taken, material improvements and simplifications of existing codes have been effected.

MISCELLANEOUS PROVISIONS.

(CHAPTER VIII.)

28. This contains a number of miscellaneous provisions, mainly of a technical nature, including (section *one hundred and twenty-five*) the definition of terms used in the Bill. As "definitions" are usually given in the opening clauses of a law, it may be useful to point out the place of the definitions in this Bill, for the benefit of those who desire to make a close and accurate study of its provisions.

Cost of System.

29. In conclusion a word may be said in reference to the financial aspects of the scheme. As will have been seen from the foregoing the citizen force will be an unpaid force. The present militia and volunteer system of capitation grants will not be followed, but the Government will be responsible for all the necessary financial arrangements and expenditure in connection with corps, and commanding officers will no longer be saddled with this harassing duty. Only the permanent forces, including the South African Mounted Riflemen, the headquarters' staff and the districts' and instructional staffs, who will be in the permanent employment of the country, will be paid. As long, also, as the existing arrangements for coastal defence continue, the Coast Garrison Artillery will continue to be a partially paid force. Beyond that, citizens—both officers and men—will render their national service freely, and it will thus be possible to secure an adequate and efficient defence system at a moderate total cost to the country. It is not yet possible to give detailed estimates of the cost of the whole system, but taking into account the money now expended on defence and police purposes, it may be said that the whole system when in full operation is not likely to make any additional demand on Union revenues of more than £300,000 a year. For this additional outlay it is hoped that it will be possible not only to organize a citizen army at least three times the size of the present militia and volunteer forces and more highly trained and efficient, but in addition to secure a permanent striking force of about 2,500 mounted riflemen, a permanent artillery force of the highest standard, an adequate system of coastal defence, and finally a military college in which a sound technical training will be given to the future military leaders of South Africa.

Diagram.

30. The annexed diagram may help to illustrate the defence system propounded in the Bill.

Department of Defence,
Pretoria,

November, 1911.

Diagram illustrating the System of Military Defence proposed for the Union.

FIRST LINE.

THE ACTIVE CITIZEN FORCE.

Composed of Citizens between their 17th and 25th year (both included) who are undergoing "peace training".

THE COAST GARRISON FORCE.

Partially paid, composed of Citizens who enter voluntarily and allotted to Coast Defence.

THE PERMANENT FORCE.

South African Mounted Riflemen.

SECOND LINE.

A.C.F. RESERVE, CLASS "A".

Formed of Citizens, not past their 45th year, who have undergone four years' peace training.

A.C.F. RESERVE, CLASS "B".

Formed of Citizens not past their 45th year, who are serving or have served in Rifle Associations.

C.G.F. RESERVE.

Formed of ex-members of C.G.F. to the required strength, who elect to perform reserve service in that force.

THE FIELD RESERVE, S.A.M.R.

Formed of
(1) Ex-members of S.A.M.R. who volunteer.
(2) Specially selected Class "A" A.C.F. reservists who volunteer.

THIRD LINE.

THE NATIONAL RESERVE.

Comprising all Citizens between their 17th and 60th year (both included), who do not belong to the First or Second Line.

ORGANIZATIONS WHICH DO NOT TAKE THE FIELD.

CADETS.

Boys between their 13th and 17th year (both included).

THE POLICE RESERVE, S.A.M.R.

Formed of members of Class "B" A.C.F. Reserve, not less than 30 years of age, who volunteer.

NOTE.—(a) The Royal Naval Volunteer Reserve, being designed to aid with Naval Service, is not included above.

(b) The Police Reserve, S.A.M.R., occupies the areas normally policed by the S.A.M.R. when the latter force takes the field.

(c) Members of existing Militia and Volunteer Forces may be transferred to Class "A" or "B" of the A.C.F. Reserve, as well as to the Active Citizen Force.

ABBREVIATIONS.

S.A.M.R. : South African Mounted Riflemen. C.G.F. : Coast Garrison Force. A.C.F. : Active Citizen Force. R.N.V.R. : Royal Naval Volunteer Reserve.

REFERENCE TO SECTIONS IN THE BILL.

S.A.M.R. : 12, 36, 37, 41, 42, 74 (Reserves : 24, 37). C.G.F. : 13, 38, 39, 40, 46, 75, 77. A.C.F. : 16, 17, 18, 38, 39, 40, 75, 77 (Reserves : 19).
R.N.V.R. : 5, 21, 22. National Reserve : 20, 76. Rifle Associations : 4, 65, 66, 67. Cadets : 6, 68, 69, 70, 71, 72, 73.

XIX.

THE STUDY OF TACTICS FROM HISTORY.

ILLUSTRATED BY INCIDENTS FROM THE BATTLE OF WOERTH.¹

By BRIG.-GENERAL J. P. DU CANE, C.B., C.R.A., 3rd Division.

A STORY is told of Lord Seaton, better known as Colonel Colbourne of Peninsular fame, that when asked how a man could best become proficient in the art of war he replied: "By fighting, Sir, and a great deal of it." By which no doubt that distinguished officer meant to imply that a little practice is worth a great deal of theory.

On the other hand, Frederick the Great's mule, which, in spite of its twenty campaigns, was "still a mule," is even more notorious. It lacked the brain power to apply its unique experience of war.

Given the brain power, no one would be so rash as to belittle the value of war experience. But the civilized world in the twentieth century is normally at peace, and if the officers of the armies of the great nations are to prepare themselves for war, some substitute must be found for actual war experience. We have, of course, a very excellent system of practical training with troops, but it is generally admitted that this system must be supplemented by study.

On this subject of study a well-known authority has written: "It is not pretended that study will make a dull man brilliant, nor confer resolution and rapid decision on one who is timid and irresolute by nature; but the quick, the resolute, the daring, deciding and acting rapidly, as is their nature, will be all the more likely to decide and act correctly in proportion as they have studied the art they are called upon to practice."

If study we should, it is obvious that we must turn to military history. But we may read military history with different objects in view—namely, to study strategy and the higher branches of the art of war, or to extract from our reading tactical principles and to learn to apply them to the changed conditions of our own time.

¹ The writer has relied for his facts and for many of his comments on the following works:—"French Official History," "German Official History," Bonnal's "Froeschweiler," Henderson's "The Battle of Woerth." Maps by Captain T. H. Davidson, D.S.O., King's Royal Rifles; Panoramas by Captain B. R. Moberly, 56th Rifles, Indian Army.

As regards the first of these objects it is sometimes argued that such study is only necessary for officers who aspire to high command or to hold important positions on the staff. Colonel Henderson's opinion on this question is instructive. He held such views in the greatest contempt, going so far as to say that "this extraordinary doctrine is either an impudent excuse for idleness, or an abject admission that the more intellectual branch of the military art is utterly beyond the capacity of the ordinary officer."

If we are to accept this view of the necessity for the study of strategy—which is obviously the official view as officers are examined in the subject for promotion—what are we to say of the study of tactics? Surely that it is of greater importance still to all officers, who, to quote Henderson again, "aspire by any conceivable stretch of courtesy to be rightly called professional soldiers."

But when we come to consider how tactics are to be studied from history, we are confronted by a considerable difficulty. Whatever may be said of the immutability of the principles of strategy, there can be no question that the constant improvement of weapons affects tactics profoundly. Moreover, it takes time to write history. Before an account is published of the minor incidents of the battles of a great campaign, sufficiently detailed to enable us to study the tactical methods employed, the weapons that were used are out of date, and it has already become necessary to consider modifications in the application of tactical principles. As instances may be quoted the French Official History of the 1870 war, and the present state of our knowledge of the incidents of the Manchurian war. The former, for a variety of reasons, only began to appear about eight years ago, and it must be admitted that the light that has as yet been thrown on the minor tactics of Manchuria is imperfect.

How then is this difficulty to be surmounted? Henderson again comes to the rescue. When discussing tactical theory in the introduction to his pamphlet on the battle of Woerth he writes: "Theory is of two kinds. First, there is speculative theory, which, in default of great campaigns fought with modern matériel, endeavours, from a study of ballistics, of new inventions, of results on the ranges, of the incidents of manœuvres and field-days, to forecast the fighting of the future. Second, there is theory, which is based on the actual experience of war; theory, which does not neglect to consider the modifications which new arms and appliances may produce, but puts in the foreground the conditions which ruled the last great battles between civilized armies."

This view of the question is of considerable assistance in helping us over the stile. Theory, based on actual experience of war, must obviously rest on the lessons of military history. Speculative theory must be based on technical knowledge of the capacity of weapons and the imagination. The intelligent student of history will be able

to discriminate between what he can accept as applicable to the present day and what he must discard as inapplicable, if he keeps this distinction in mind. But when he enters the realm of speculation, and history becomes an unreliable guide, to what is he to turn? The answer is supplied to us in some remarks of Colonel Gough in an article in a recent number of this REVIEW.² In dealing with the question of instruction in the application of tactical principles, he says that first class instructors are required who are fully conversant with the views of the General Staff.

Speculative theory must be supplied to the student by the General Staff, which, as a body, studies the lessons of history, picks the brains of the experts in weapons, and, combining judiciously the different aspects of these problems, builds up for us our theory of modern tactics, and embodies the result in our Field Service Regulations and Training Manuals. For the study of tactics from history to be profitable, therefore, it must be combined with the study of the Regulations published by the General Staff.

It is proposed in this article to illustrate the above arguments by an analysis of some of the incidents of the battle of Woerth, in order to show how abiding is the value of some of the lessons of that battle, and, at the same time, how necessary it is to modify some of the methods that were employed with success on that occasion.

Before entering on an actual description of the ground and the fighting, it is desirable to draw attention to the positions occupied by the two armies,³ and the considerations that animated the two Commanders on the eve of battle. Strictly speaking, this may be straying somewhat from the subject of this paper. Strategy has been defined as the art of bringing the enemy to battle, while tactics are the methods by which a commander seeks to overwhelm him when battle is joined. At the same time, the transition from one to the other is so natural, that a few words on the former at this point may not be out of place.

THE POSITION OF THE FRENCH ARMY IN ALSACE.

It must be borne in mind that the original deployment of the whole French army had been on the line of the frontier, apparently with the object of guarding every possible point at which the enemy might penetrate. It was not till after the battle of Weissenburg that the Emperor had placed at the disposal of MacMahon the Vth Corps, in addition to the Ist and VIIth Corps which were already under his command, and that the Marshal had been ordered to form them into an army for the purpose of opposing the IIIrd German army under the Crown Prince.

Strategically, the French army in Alsace was a detachment from

² See article entitled "Peace Training for Command," THE ARMY REVIEW, Vol. I, No. 2, p. 242.

³ See Map No. 1.

the main army in Lorraine, and should have complied with the rules for the employment of a detachment. That is to say, it should have been drawn into the main army unless it could be so used as to occupy and draw off from the main theatre a stronger force of the enemy. How then could MacMahon fulfil these conditions? He had in front of him a superior force of the enemy. If he could occupy it in Alsace and prevent it from crossing the Vosges and co-operating with the 1st and IInd German armies in Lorraine, he would be helping his side. But this object could not be achieved by accepting battle against heavy odds. Skilful manœuvre was necessary, with the double object of drawing the enemy away from the Saar and preserving his own communications. An opportunity for a successful offensive might thus have been obtained. These conditions point distinctly to his refusing battle on the Woerth position and retiring, covered by a strong rear-guard, in the first instance, towards Saverne, where he would have been well placed to cover his own communications and prevent the IIIrd German army crossing the Vosges.

In order to carry out such an operation it was necessary that MacMahon should concentrate his available forces, obtain accurate information as to the movements of the enemy, and take special precautions for the protection of his own right, which was very much in the air. It must be acknowledged that he did not take adequate steps to carry out any one of these important duties of a Commander.

The entire blame for failure to concentrate cannot be laid on MacMahon. The Emperor had given him very little time in which to do so, having placed the Vth Corps at his disposal as late as the morning of the 5th August.

The positions of his Corps on the evening of the 5th August were as follows :—

Ist Corps	..	..	..	At or about Froeschweiler.
Ist Division, VII th Corps	..		..	Railed on 5th from Colmar to Reichshoffen without its artillery.
Remainder of VII th Corps	..		..	About Mulhausen.
V th Corps	..	..	..	3rd Division at Bitche.
"	..	..	..	1st " 2 miles north of Bitche after a hard march on the 5th.
"	..	..	..	2nd Division, Rohrbach and Saargemund, with the enemy menacing in the valley of the Blies.

As soon as the Vth Corps had been placed at his disposal, MacMahon ordered De Faily, commanding the Corps, to come to him at once, and pointed out to him very strongly the necessity for concentration. But De Faily replied that he only had one division ready to move, which he would send to Reichshoffen on the 6th, starting at daybreak. The correspondence between the two shows that MacMahon was not

sufficiently firm and insistent. Moreover, the action of a small German detachment on the Upper Rhine was allowed to hold the remainder of the VIIth Corps far to the south in the neighbourhood of Mulhausen.

The importance of immediate concentration had not been fully realized, nor had MacMahon decided on a definite course of action if attacked. He did not appreciate the danger of an immediate attack, thinking, as indeed was the case, that the Crown Prince did not intend to advance till the 7th at earliest. When the action started, he was still in a state of indecision, arguing with Ducrot as to the merits of a certain plan for withdrawing into the Vosges. He first gave the order to retire, and then, his attention being arrested by a fresh outburst of fire, he cancelled this order and decided to stay and fight. So the decision to fight a battle on the part of the French Commander was arrived at, not on a broad survey of the strategical situation, but, as so often happens in war, on account of a trivial incident which arrested the personal attention of the Commander.

Nor had MacMahon done all that was possible to obtain information as to the movements and intentions of the enemy. He had lost touch after Weissenburg, and was ignorant as to the direction in which the bulk of the enemy's forces was moving, whether on Bitche, Woerth, or Strasburg. He was strong in cavalry, but the strategical employment of that arm for the purpose of obtaining information was not at that time understood in the French army, and the conclusion he had arrived at, that he would not be attacked till the 7th, was a pure surmise.

His possible lines of retreat had not received the consideration which they deserved. From his present position there were three roads leading to Reichshoffen, through Neeshweiler, Froeschweiler, and Eberbach, and from Reichshoffen there were alternative routes. The first led through the Vosges via Niederbronn and Bitche, but if the enemy were to assume the offensive on the Saar, MacMahon could not fall back by this road. The second led over the southern spurs of the Vosges to Saverne, and the third by the Rhine plain to Strasburg. If the first must be discarded, the imperative necessity of maintaining the right flank is apparent, but the Marshal took no steps to do so, the bulk of his cavalry and his reserves being placed in rear of his centre. The maintenance of railway communication with the main army in Lorraine by means of the Strasburg-Bitche-Saargemund railway appears to have influenced the Marshal in staying so long at Woerth; but, as has already been shown, an offensive on the part of the enemy north of the Vosges would at once have compromised this line which was too far forward to be relied on.

Lastly, MacMahon had taken no precautions to make the position which he occupied as secure as possible. Little or no entrenching had been carried out, and only some of the bridges over the Sauer had been destroyed, others being left intact.

History is bound, therefore, to condemn somewhat severely the strategy of the French Commander. His position was a difficult one owing to the want of plans and the hesitations of the Chief Command, but he had not done all that was humanly possible to improve matters within the sphere of his own responsibilities.

THE POSITION OF THE IIIRD GERMAN ARMY.

On the night of the 5th August the IIIrd German army was disposed as follows:—

IInd Bavarians ..	..	Lembach. .
Vth Corps ..	..	Preuschdorf, with outposts on the line Goersdorf-Gunstett in touch with the enemy on the Sauer.
XIth Corps ..	..	Soultz.
Von Werder's Corps ..	..	Aschbach.
Ist Bavarians ..	..	Ingolsheim.
4th Cavalry Division ..	..	Schoenenburg.

The army was therefore facing South with three Corps in front line, the Vth (Preuschdorf), XIth (Soultz), and Von Werder's (Aschbach), the distance from Preuschdorf to Aschbach being eight miles.⁴ The Ist and IInd Bavarians were in second line, but the IInd Bavarians were separated from the rest of the army by the Hochwald, a serious obstacle. The Vth Corps, being the right flank of the front line, was in touch with a superior force of the enemy on the right bank of the Sauer. Up to now the Crown Prince had been doubtful of the direction in which the main French concentration would take place. He had information of French troops at Hagenau and at Bitche, but, on the evening of the 5th August, he concluded, from the information in his possession, that MacMahon would draw in the Vth and VIIth Corps, dispose his troops so as to protect the Hagenau-Saargemund railway, and accept battle behind the Sauer. We are told that his orders for the 6th were based on this assumption. They ran as follows:—

“The army will remain concentrated to-morrow round Soultz and execute a change of front.

“1. The IInd Bavarians and Vth Prussian Corps remain in their present position at Lembach and Preuschdorf.

“2. The XIth Prussian Army Corps will wheel to the right and bivouac at Holschloch, its outposts pushed forward towards the Sauer. Surburg and the roads to Hagenau will be occupied.

“3. The Ist Bavarian Corps will advance as far as the neighbourhood of Lobsann and Lampertsloch. Outposts thrown forward through the Hochwald in the direction of the Sauer.

⁴ See Map No. 1.

" 4. The 4th Cavalry Division remains in bivouac, but will front westward.

" 5. Werder's Corps will march to Reimersweiler and show front towards the South, its outposts pushed forward towards the Hagenau forest. The roads to Kuhlendorf and the railway at Hoffen are to be protected by strong outpost detachments.

" The headquarters remain at Soultz."

One or two points in connection with these dispositions are worthy of comment. Two Corps and the Cavalry Division remained stationary, and the remaining Corps each moved a distance of six miles. Moreover, no Corps was at a greater distance than fifteen miles from the Sauer on the evening of the 5th, and the greater part of the army was within ten miles. The considerations that should have influenced MacMahon as to remaining to fight a battle on the Sauer have already been discussed, and the arguments against such a course have been stated. The Crown Prince's information seems to have been accurate, but his conclusions hardly seem to have been justified. Time is the essence of strategy, and an opportunity lost may not recur. To waste a day in minor adjustments in the positions of his Corps showed, to say the least of it, some complacency, and might well have afforded his adversary an opportunity to escape from an awkward situation. The Corps were all within supporting distance of one another, and care in the allotment of roads in the Army Orders could have brought them to the field earlier than was actually the case. The XIth Corps, for instance, marched by a single road, which was not necessary, and the arrangements made for the march of the other Corps are open to considerable criticism.

The Crown Prince was anxious about the exposed position of the Vth Corps, and his anxiety led him to commit a blunder. On the afternoon of the 5th he sent an order to the IIInd Bavarians to direct their attention to the Bitche road and to Langensultzbach. "Should the report of cannon be heard on the following morning in the direction of Woerth, a Division of the Corps was to advance against the enemy's left flank, the remainder to be halted facing Bitche."⁵

This order was not repeated to the Vth Corps with results that we shall see presently. But what justification was there for the Crown Prince's anxiety? The Dieffenbach ridge, which was held by the Vth Corps' outposts, was a strong position, and surely he could have wished for no better solution than that the French should attack him in that position. The distances that his Corps would have to march to reach the field would be much reduced, and the issue could not be doubtful.

THE BATTLEFIELD.

The position occupied by the French at Woerth was on a spur of the Vosges running in a Southerly direction into the Rhine plain. The

⁵ "German Official History."

root of the spur is at Neehweiler, and the apex at Morsbronn, the distance between the two being about $4\frac{1}{2}$ miles. Facing the Woerth position to the East, and separated from it by the valley of the Sauer, is the Dieffenbach ridge, extending from the wooded Hochwald to the village of Gunstett, where it drops somewhat abruptly into the plain. The Sauer is a stream 30 to 40 feet wide, rising in the Vosges, and running through a flat valley of meadow land of an average width of some 800 yards. On the day of the battle, the stream was from four to eight feet deep, being much swollen by floods. The Hochwald, forest clad and rising to a height of 1,500 feet, is a serious tactical obstacle and completely cuts off the Dieffenbach ridge from the Lembach valley. The chief tactical points on the Woerth position are the villages and woods and the spurs running down into the valley of the Sauer. The principal villages are Neehweiler, Froeschweiler, Woerth, Elsasshausen, and Morsbronn, to which must be added the farm called the Albrechtshauserhof just South of the Niederwald. The important woods are the Langensultzbach wood, the Froeschweiler wood, the Elsasshausen copse, and the Niederwald, mostly beech woods without much dense undergrowth. Apart from the Morsbronn spur, which is a very distinctive feature, the most important spurs are the Galgenberg, running East from Elsasshausen, and the spur running from Froeschweiler to a point just North-West of the village of Woerth. No account of the ground would be complete without mentioning the narrow clearing between the Langensultzbach wood and the Froeschweiler wood, the wooded spur between the Sultzbach and the Sauer, and the peculiar dome-shaped Gunstett hill, which is separated from the main Dieffenbach ridge by a big re-entrant, at the mouth of which lies the village of Spachbach. A last reference must be made to the Forstheim ridge, which lies to the West of the Morsbronn ridge, and is separated from it by the little valley of the Eberbach.

Such ground as is not wooded is much cultivated with hop gardens, vineyards, and corn. There are many terraces and sunken roads, and the terrain on the position itself is unsuitable for cavalry, which arm, however, could have found plenty of scope for its activities in the Rhine plain.

FRENCH DISPOSITIONS.

The French dispositions at 8.15 a.m., when they had taken post for battle, are shown on Map II.

The troops available consisted of approximately :—

Ist Corps	..	{	1st Division	..	Ducrot.
			2nd	..	Pellé.
			3rd	..	Raoult.
			4th	..	Lartigue.
VIIth Corps	..		1st	..	Du Mesnil (less its Artillery).

Bonnemain's Cavalry Division.

Duhesme's

Reserve Artillery—8 Batteries.

The strength of the Divisions varied considerably, but the total is given as 46,000 combatants, consisting of 58 battalions, 44 squadrons, 107 guns and 24 machine guns.

The troops were disposed in the following order :—

Ducrot	..	..	..	Neehweiler to Southern edge of Froeschweiler wood.
Raoult	..	..	..	Southern edge of Froeschweiler wood to Elsasshausen (exclusive).
Du Mesnil	..	..	..	About Elsasshausen.
Lartigue	..	..	..	Elsasshausen copse to Morsbronn.
Michel's Cuirassier Brigade				Eberbach.
Pellé	..	..	..	} Under cover between Froeschweiler and Elsasshausen.
Remainder of Cavalry	..			
Reserve Artillery	..	..		

There are two prominent salients in the position—the Froeschweiler wood and the Niederwald. These were held by the front line, which in other parts of the position was placed well down the forward slopes of the spurs. The second line ran along the crest of the ridge. The Divisional Artillery, which consisted of two batteries of 9-pr. or 25-pr. guns and one battery of machine guns in each Division, was distributed throughout the front. Within reach of the field were approximately 100,000 Germans, consisting of 100 battalions, 80 squadrons, and 360 guns.

THE BATTLE.

Space does not permit of a detailed account of the fighting, for which the reader is referred to the French and German Official Histories, but an attempt will be made to bring out the salient points in the different phases of the battle, namely, (i) the engagement of the advanced guards, (ii) the general engagement, and (iii) the decisive attack.

(i) *The Engagement of the Advanced Guards.*

The outposts of the Vth Corps were found by the 20th Brigade, 2 squadrons of Cavalry, and 1 battery, under General Von Walther. They were disposed as follows :—

$\frac{1}{2}$ Battn. 37th Regt.	..	Goersdorf..	} Furnishing outposts on the line of the Sauer with 1 Company at the Bruchmill.	
1 „ 50th „	..	Dieffenbach		
1 „ 50th „		Gunstett ..		
1 Squadron	..			

Remainder of outpost troops near Dieffenbach. Woerth was not occupied.

At 4 a.m., Von Walther heard a commotion in the village of Woerth, which he took to be caused by the enemy retiring. It was very misty

and had been raining hard. Von Walther sent to General Von Kirchbach, the Commander of the Vth Corps, and asked for leave to reconnoitre and see what the enemy was doing. By 7 a.m., the mist had cleared, but as no answer had been received from Von Kirchbach, Von Walther took upon himself to employ 1 battalion in reconnoitring. He brought his battery into action near Dieffenbach, and the battalion advanced towards Woerth. The battery fired a few rounds into the village, on which a few French soldiers, who had left their bivouacs in search of food and drink, cleared off. The Germans entered the village, found the bridge destroyed, waded the stream, and a section pushed on to the Western outskirts of the village. When they reached this point they were fired on by a battery of French Artillery, and a little artillery engagement ensued with Von Walther's battery near Dieffenbach. As it was clear that the French had not retired, Von Walther withdrew his reconnaissance, leaving a company in Woerth.

At about the same time that this was occurring, General Lartigue decided to push a reconnaissance towards Gunstett with the object of ascertaining if the Germans were in strength in that neighbourhood. He ordered a battalion of the 1st Chasseurs, supported by a field battery, a machine gun battery, and the Zouaves in occupation of the Eastern edge of the Niederwald, to turn the German outposts out of the Bruchmill, and to occupy Gunstett Hill. The French advanced just as the advanced guard of the XIth Corps was approaching Gunstett from the East. It will be remembered that this Corps, in accordance with the Crown Prince's orders, was to march on the morning of the 6th to Holschloch and Surburg, and place outposts towards the Sauer. When the French advanced, the outposts were just taking up their position on the Western edge of the Westerholtz wood. The French were met by the battalion of the 50th Regiment in Gunstett, which was at once supported by a battalion of the advanced guard of the XIth Corps. They did not get beyond the line of the Hagenau high road, where, for the time being, we must leave them.

When General Von Hartmann, Commanding the IInd Bavarians, received on the afternoon of the 5th the instructions from the Crown Prince that have already been referred to, he ordered the 4th Division of his Corps to push forward to Mattstall at daybreak on the 6th, and establish an outpost at the Kuhbrücke, in order that he might be able to communicate with the Vth Corps by the road running round the Western end of the Hochwald. When on the morning of the 6th he heard artillery fire to the South, he at once ordered the 4th Division to advance towards Froeschweiler. At about 9 a.m., the 7th Bavarian Brigade advanced through Langensultzbach, and mistaking its direction, moved through the forest on Neehweiler instead of Froeschweiler. The 8th Brigade advanced simultaneously on its left and kept the right direction, the result being that while the 7th Brigade

was moving West on Neeweiler, the 8th Brigade very soon became engaged with the 2nd Turcos., who were holding the North-Eastern corner of the Froeschweiler wood. The 7th Brigade, hearing firing to their left rear, changed direction to the left, and presently arrived in some disorder at the South-West corner of the Langensultzbach wood. They then endeavoured to form a firing line on the Southern edge of the wood, but the units became much mixed up in the process. At the moment the Northern edge of the Froeschweiler wood was not occupied by the French, except at the North-East corner held by the 2nd Turcos. Although the 7th Bavarian Brigade had no enemy in front of them, they did not advance across the clearing at once, but contented themselves with keeping up a hot fire on the Northern edge of the Froeschweiler wood. Very soon the French extended portions of the 96th and 48th Regiments to oppose them. The Bavarians then made repeated attempts to cross the clearing. They reinforced their firing line till 10 Battalions were hotly engaged between the South-West corner of the Langensultzbach wood and the sawmill. They attempted to bring up two batteries in support to a spur which runs from the South-Eastern edge of the Langensultzbach wood to the sawmill, but the French fire was so hot that the guns could not get into action. All attempts to cross the clearing failed. At 10 a.m., 1½ battalions of the 1st Zouaves counter-attacked the right flank of the Bavarians, and drove them through the wood and across the Sauer. According to the German Official History: "A Prussian Orderly Officer⁶ brought verbal instructions to General Von Hartmann at 10.30 a.m. to suspend the contest." It is clear, however, that the original withdrawal was due to the vigour of the French counterstroke, and not to any order from superior authority. The effect was such that for practical purposes the 4th Bavarian Division was deprived of offensive power for the remainder of the day. The Zouaves returned to their original position, and Van Hartmann rallied his men and got clear by 11.30 a.m. Just about this time, he received a request from Von Kirchbach to support him, but all he was able to do in response was to undertake to hold his ground and arrest the further withdrawal of his troops.

We must now turn again to the Vth Corps. As soon as Von Walther got his reconnaissance clear in the centre it became evident that engagements were springing up on both flanks. General Von Esch, the Chief General Staff Officer of the Vth Corps, had ridden forward with an order to cease fire, but on becoming aware of the situation he decided, in consultation with the General Officer Commanding 10th Division, that it would never do in the circumstances to break

⁶ The "French Official History" gives this officer's name as Lieutenant Lauterbach, Adjutant of Brigade to General von Walther, but states that he left his General at 8.45 a.m., and did not reach Langensultzbach till 10.30 a.m., when he met General von Hartmann.

off the engagement entirely in the centre. An order was accordingly sent to the Artillery of the Corps to move forward and come into action, and the Corps was ordered to get under arms. As has already been stated, it had been raining heavily, and the country on either side of the Dieffenbach-Woerth road being arable land was consequently very heavy going. The guns trotted down the road in column of route and, when about half way down the slope, turned off on either hand. It took some 45 minutes for the 84 guns to get into action. The French in reply reinforced the Divisional Artillery, already in action in the centre of the position, with 6 Batteries of the Reserve Artillery, but the French guns were dispersed while the German guns were massed in one long line.⁷

An artillery duel ensued, in which the German Artillery very soon showed its superiority. The French Artillery withdrew from this unequal contest after about 40 minutes. They had suffered, but not very heavily, and had been in no sense destroyed. Their withdrawal seems to have been due to the fact that they realized that they were not doing much good, and as the Commander of the Artillery thought that the Ammunition Park had not arrived he was afraid of running short of ammunition.⁸ From this time forward, though the French Artillery were frequently able to intervene in the action, and often with effect, the German Artillery so completely dominated the situation in this part of the field that the interventions of the French Artillery never assumed a threatening aspect, and the German Artillery were able to devote the greater part of their attention to the support of their own Infantry, and to the repelling of counter-attacks. Such, moreover, was the confidence which the superiority of the German Artillery inspired, that Von Kirchbach at a later stage was able to use up his Infantry to the last man, being fully satisfied that the strength of his Artillery made his front inviolable, and that there was no danger of a French offensive penetrating the German centre.

While the Artillery were deploying, Von Kirchbach arrived on the field. It must be borne in mind that, at this moment, heavy fighting was taking place on both flanks, so Von Kirchbach decided to "occupy Woerth and the heights beyond" with one Brigade. Various motives have been attributed to Von Kirchbach for arriving at this decision.

⁷ The German guns fired common shell with percussion fuzes only, and many of their shells buried themselves in the soft ground and did not burst. The French Artillery was equipped with common and shrapnel shell in the proportion of 6 of the former to 1 of the latter. They also carried some case shot. They used only time fuzes, which, for the common shell, could be burst at 1,500 and 2,800 yards, and for the shrapnel could be used at four ranges between 550 and 1,450 yards.

⁸ The Ammunition Park had arrived at Reichshoffen the previous evening, but its Commander had not reported the fact to the Commander of the Reserve Artillery.

He is stated to have been influenced by the situation on the flanks, fearing that if he remained inactive the French might mass reserves against either flank or both, with the result that a portion or portions of the army might experience a severe repulse. He is further said to have desired to establish himself on the right bank of the Sauer so as to be able to cover the passage of the main body of the Corps over the river. Again, he is said to have desired to force the enemy's infantry to disclose their position and subject themselves to the fire of his superior Artillery. Whatever may have been actually in his mind at the time, he issued orders at 10 a.m. for the 20th Brigade to move forward in two Columns—

2½ Battalions 37th Regiment via Woerth.

2 " 50th " via Spachbach.

He also informed the Commanders of the IInd Bavarians and the XIth Corps of his intentions, and asked for their support. The troops moved forward at 11 a.m. and crossed the Sauer by improvised bridges made of hop poles. Some were drowned, and some casualties were suffered during the passage of the river from the fire of the French skirmishers. After crossing the river the two Columns converged towards the Galgenberg, but, as they started at the same time, and had different distances to go, the two attacks were not simultaneous. The flank of the left column was fired on from the Niederwald, and a portion of the troops were drawn in that direction. The Hagenau high road was crossed, and some progress was made up the slopes of the Galgenberg, when the 2nd Zouaves counter-attacked. The Zouaves were supported by portions of the 36th Regiment, 21st and 17th Chasseurs, and they drove the 50th Regiment back to the high road and the 37th Regiment into Woerth. They followed up into the village, but were driven out and suffered severely from artillery fire in retiring. This counter-attack drew in the whole of the 19th Brigade to support the 20th Brigade.

We left the advanced guard of the XIth Corps engaged with the French troops sent by Lartigue to drive the enemy out of the Bruchmill. The 41st Brigade and 4 batteries moved forward to reinforce the 2 battalions already engaged. The original object of this advance appears to have been to secure a defensive position on the left bank of the Sauer. Two columns were hastily formed and advanced as under :

1 battalion	..	} 87th Regiment ..	..	} via Spachbach.
2 companies	..			
1 battalion	..	} 80th " ..	..	} ..
1 battalion	..			
2 companies	..	} 87th " ..	..	} via Gunstett.
1 battalion	..			
	..	} 80th " ..	..	} ..
	..			

The haste in forming these two columns was no doubt responsible for the breaking up of the regimental organization, but it resulted in

the loss of tactical unity in the XIth Corps from the very start of the action, and bore fruit later.

The Spachbach column became engaged with the enemy, and the initiative of the officers appears to have led first of all to the passage of the river, and subsequently to the attack of the Niederwald. Owing to the exposure of the Eastern edge of the wood to artillery fire from Gunstett Hill, the Germans had little difficulty in driving the 3rd Zouaves back from the edge of the wood and entering it. Once inside the wood they became engaged in a desperate fight with the Zouaves, and were deprived of artillery support. The Zouaves counter-attacked and drove them back over the river, but did not follow up owing to the enemy's artillery fire.

The Gunstett column crossed at about the same time and advanced against the 1st Chasseurs, who were holding the line of the high road. The Chasseurs at first fell back, but turned about when reinforced by a battalion and 2 companies of the 3rd Turcos and supported by 2 battalions 56th Regiment, and counter-attacking the Germans in front and flank drove them back over the river in spite of the fire of the 4 batteries on Gunstett Hill. The Turcos followed up to the outskirts of the village of Gunstett, and when compelled to retire, held on obstinately in a hop garden near the bridge. The 56th Regiment assisted the Turcos to withdraw, and this counter-attack drew in 5 battalions of the 42nd Brigade to support the advanced guard of the XIth Corps.

The advanced guards of the Vth and XIth Prussian Corps and the IIInd Bavarians had thus made isolated and disjointed attacks on the French position, and by 11.30 a.m. they had been repulsed everywhere. 17,000 men had been engaged, and the losses had been heavy. The only troops that had gained a footing on the right bank of the Sauer were those belonging to the Vth Corps which were holding Woerth, and were hanging on by their eyelids, so to speak, on the line of the high road at the foot of the Galgenberg.

(ii) *The General Engagement.*

It is necessary now to hark back for a moment to an important event which took place an hour previously, viz., at 10.30 a.m. The Crown Prince, as has been stated, was at Soultz. When the firing was heard early in the morning he sent an officer of the Headquarter Staff to the Headquarters of the Vth Corps to report. This officer's report left the field at 9.30 a.m., and gave the state of affairs as far as it could be seen from the Dieffenbach ridge. At 10.30 a.m. Von Kirchbach received a message from the Crown Prince, which ran as follows:—"Do not continue the struggle, and avoid everything that may induce a fresh one."⁹ The receipt of this message placed Von Kirchbach

⁹ This order was repeated to the Commanders of the IIInd Bavarians and the XIth Corps.

in a difficult position. The situation had changed considerably since the Officer wrote the report on which the Crown Prince's order was based, and the Crown Prince, when he caused the order to be sent, was not aware of the situation which now confronted Von Kirchbach. It, therefore, became the duty of the latter to act on his own responsibility, and to ignore the Crown Prince's order if he thought it advisable to do so.

Basing his opinion on the loss of *moral* that would result if an action that had proceeded so far with so little success should be broken off, he decided to continue the action, and called upon Von Hartmann (IIInd Bavarians) and Von Bose (XIth Corps) to support him. The IIInd Bavarians, as we have already noted, were in no position to render assistance, and we must now turn again to the XIth Corps.

General Von Bose, Commanding XIth Corps, was distant from the field when he received Von Kirchbach's first appeal for assistance. He replied that his orders precluded his engaging his Corps, but he rode forward at once to Gunstett Hill, and on arrival there received another urgent appeal for support. To this second appeal he replied that he would not leave the Vth Corps in the lurch, and at once prepared to bring the full strength of his Corps into play.

We have already seen how the greater part of the 41st and 42nd Brigades composing the 21st Division of the XIth Corps had been drawn into the fight to support the advanced guard against the French counter-attacks. The intention of Von Bose appears to have been to attack the enemy in front viâ Spachbach and Gunstett with the 21st Division, and to assign to the 22nd Division the task of attacking the enemy's right flank. That there was confusion in assigning the troops to their various tasks seems to be proved without question, and this may be attributed to two main causes, namely, the haste with which the columns were formed, and the abuse of initiative on the part of General Von Schkopp, Commanding the 44th Brigade. General Von Gersdorff, Commanding the 22nd Division, allotted to the 43rd Brigade the task of attacking the French right, ordering 2 battalions 32nd Regiment to move viâ Durrenbach on Morsbronn, and 2 battalions 95th Regiment "to move up to the fighting line of the 21st Division." He also sent an order to the 44th Brigade to move to Gunstett in reserve. Von Schkopp had, however, diverted the march of the 44th Brigade by a by-path as soon as the head emerged from the Westerholtz wood, and when he received the order of his Chief he was already well on his way to Durrenbach. He took upon himself not to comply with the order, but sending to Gunstett only his rear Regiment, the 83rd, he placed himself at the head of the 32nd and 94th Regiments, and continued to move on Morsbronn. It thus arose that the force moving on Morsbronn, instead of consisting of 2 battalions only, as would have been the case if the orders of Von Gersdorff had been

carried out, now consisted of 2 battalions 32nd Regiment and 3 battalions 94th Regiment, a formidable force. While, therefore, the breaking-up of formations was aggravated by Von Schkopp's action, the immediate success of the turning movement must be directly attributed to his indiscipline and abuse of initiative. Such is the fortune of war.

In the end, then, 3 columns of attack were formed as follows :—

3 battalions	..	88th Regiment	(42nd Brigade)	} Moving by Spachbach — objective the Niederwald.
1½	..	80th	„ (41st „)	
1½	..	80th	„ (41st „)	
2	..	95th	„ (43rd „)	} Moving by Gunstett — objective the Albrechtshausenhof.
1½	..	87th	„ (41st „)	
1	..	80th	„ (41st „)	
1 rifle battalion	..	..	.. (21st Division)	} Moving by Durrenbach — objective Morsbronn.
2 battalions	..	32nd Regiment	(43rd Brigade)	
„	..	94th	„ (44th „)	
2 companies	..	80th	„ (41st „)	

The whole of the artillery of the Corps was ordered to Gunstett Hill, where 72 guns came into action at reduced intervals, 2 batteries being crowded out.

The Reserve of the Corps was assembled East of Gunstett, and consisted of :—

82nd Regiment	..	..	..	..	(42nd Brigade)
1 battalion 95th Regiment	..	..	..	..	(43rd „)
83rd Regiment	..	..	..	..	(44th „)

It will thus be seen that there were portions of the 80th Regiment in all three Columns, and that no single Brigade remained intact. The organization of the Corps was completely broken up, and the subordinate Commanders can have had no clearly-defined duties.

The frontal attack, having the shortest distance to go, got to work first, and fully occupied the attention of the French. As in the case of the Vth Corps, the great massed battery on Gunstett Hill very soon dominated the situation. Lartigue's weak divisional artillery was not reinforced from the Reserve Artillery, although the artillery positions available on the Morsbronn ridge were probably superior to the German positions on Gunstett Hill. The French batteries were shortly obliged to withdraw to positions that were defiladed from Gunstett Hill, and, consequently, were unable to oppose the advance of the German infantry with effect. The frontal attack, therefore, continued to gain ground, and to press back the infantry of Lartigue's Division, till possession was gained of the Albrechtshausenhof.

Morsbronn was held by an outpost of two companies only, which gave way before the turning movement of the Durrenbach column. The Germans occupied the village and advanced up the slopes. The

position of Lartigue's infantry now became critical. They were driven into a somewhat confined space, forced to face two ways at once, and subjected to the fire of a greatly superior artillery. The turning movement had thrown the right back across the ridge in a line composed of a confused mass of men of the 56th Regiment, 3rd Turcos, and 1st Chasseurs. The artillery endeavoured to co-operate from a position in rear of the crest defiladed from Gunstett Hill, but their efforts were not very successful. The Albrechtshauserhof was in possession of the enemy, and strong bodies of German infantry were pressing forward on all sides. In his extremity, Lartigue appealed to MacMahon for reinforcements, but received the reply that the Marshal had none to send to him, and that he must stand firm. MacMahon added that a Division of the Vth Corps had left Bitche at 4 a.m., and that he hoped it would arrive in time.

Lartigue foresaw that his Division would be annihilated if he persisted, so he endeavoured to extricate the debris of his force. He sent his guns to a position North-West of Eberbach on the Forstheim ridge to cover the retirement, he got together some men of mixed units, and made a counter-attack towards the Albrechtshauserhof, and he asked General Michel, Commanding the Cuirassier Brigade, to help him by charging the enemy approaching from the direction of Morsbronn with a Regiment of Cuirassiers.

General Michel at first demurred, but being again appealed to he consented. His Brigade at this time was under cover on the left bank of the Eberbach, just East of the village of that name. It was facing East in three lines thus:—

4 squadrons	..	..	..	..	..	8th Cuirassiers.
3	„	..	..	..	..	9th „
2	„	..	..	..	..	6th Lancers.

The ground had not been reconnoitred with a view to its possibilities for Cavalry action, and there were no scouts out. The ground was most unsuitable for the shock action of Cavalry, being much intersected with vineyards, hop gardens, orchards, little banks and ditches, cultivation, and sunken roads. Michel asked Lartigue what he was to charge, and the latter pointed to the German infantry advancing from Morsbronn. The 8th Cuirassiers in front line found the ground so cramped that they were forced on to a front of two squadrons. As they advanced, their left was fired on at close range, but though they lost heavily they continued their career towards Morsbronn. The German infantry opened out in front of them as they went by, took refuge in the hop gardens and behind cover, and fired into their flanks. They reached the North-East corner of the village and charged down the street, fired at from the houses. At the end of the street they found a barricade, so had to turn about and try and find another loophole of escape. Eventually, about 50 men found their way into the plain and galloped on towards

Durrenbach and the Hagenau forest till their horses were exhausted. The remainder were either killed or taken prisoners.

The 9th Cuirassiers charged in second line to the right of the line taken by the 8th Cuirassiers, and were followed by the 6th Lancers. They were able to deploy into line, and galloped over two companies of the 32nd Regiment which formed the extreme left of Von Schkopp's infantry. The greater part of these two regiments then made for the South-West corner of Morsbronn, and rode into the main village street which runs East and West. The houses were occupied by the German infantry, and the exits from the village were by now all barricaded. Few of the Cavalry escaped. The dead horses lay so thickly in the streets that later in the day the Germans were obliged to abandon the attempt to get their transport wagons through the village.

The remnants of the Cavalry endeavouring to rejoin found themselves cut off, and many were taken prisoners. A curious incident in this connection is related in the French Official History. A remnant of about 50 Cuirassiers were returning to the West of Morsbronn up the Eberbach valley, when they were espied by a squadron of the 13th Hussars. The Hussars advanced to attack, but the Cuirassiers wheeled about, and the two forces approached within ten yards of one another and halted. There was no charge, but a few men on either side drew their pistols, and a few saddles were emptied. Both the combatants then withdrew, leaving one another unmolested. The German Official History describes this incident as a "bloody collision."

This disastrous charge, combined with the counter-attack of some groups of men belonging to the 56th Regiment, 3rd Turcos, 1st Chasseurs, and 3rd Zouaves, gained a little respite for Lartigue's infantry, which he was able to withdraw towards Shirlenhoff and Gundershoffen, covered by parties in the wood and village of Eberbach.

One Regiment of the XIth Corps followed Lartigue's Division for a short distance only. The remainder, supported by the greater part of the reserves of the Corps, plunged into the Niederwald, where they fought desperately with the 3rd Zouaves, who disputed every inch of the ground. They did not reach the Northern edge of the wood till 2 p.m., by which time the Corps was in a state of inextricable confusion. All tactical unity and control was lost, and, for the time being, the troops were incapable of a further offensive effort.

The Crown Prince arrived on the field about mid-day, and was evidently at sea for some little time as to the state of affairs. His first inclination was to order all available troops to move towards the centre, probably being impressed with what he considered to be the dangerous position of the Vth Corps. The first order issued by Count Von Blumenthal, Chief of the Staff to the Crown Prince, was as follows :—

6th August, 1 p.m.

"The Vth Corps will postpone its attack till the approach of General Von der Tann, who has been directed to the North of Preuschorf. The approach of the 21st Division, which has been ordered to march on Woerth, will also be awaited. They cannot arrive for an hour or two. Werder's Corps has also been ordered up, but it will be quite 3 hours before it arrives."

(Signed) VON BLUMENTHAL.

As we have already seen, the 21st Division was fully engaged with Lartigue's Division at this time. Different counsels appear to have prevailed shortly, for the German Official History tells us that the Crown Prince judged that even if MacMahon had succeeded in concentrating a Division of the Vth Corps with his own troops, the French forces opposed to him could not exceed 60,000 men. Although portions of his own army were still at a distance from the field, they could all arrive during the afternoon. A better opportunity might not occur, so he decided to press the battle to a conclusion. The Crown Prince accordingly issued the following order at 1 p.m. :—

"The IInd Bavarian Corps will press upon the left flank of the enemy in such a manner as to gain a position in rear of it towards Reichshoffen.

"The Ist Bavarian Corps will march as rapidly as possible and come into line between the IInd Bavarians and the Vth Corps, holding a Division in reserve.

"The XIth Corps will advance with energy via Elsasshausen and past the Niederwald on Froeschweiler.

"Of Werder's Corps the Wurtemberg Division will follow the XIth Corps on Gunstett and over the Sauer; the Baden Division will move for the present as far as Surburg."

No mention is made in the German Official History of the 4th Cavalry Division, but according to Von Hahnke, it was to form the General Reserve of the army.

The fight, in the centre of the field, remained stationary for some little time. At 2 p.m., however, the XIth Corps appeared to be making good progress on the left, so a further offensive effort was made by the Vth Corps.

2 battalions, 17th Brigade, attacked from Woerth with their right on the Froeschweiler-Woerth road.

2 battalions, 18th Brigade, crossed at Spachbach and attacked the Southern end of the Galgenberg.

The 17th Brigade was counter-attacked by the 2nd Zouaves and driven back to Woerth, while the 18th Brigade was counter-attacked by portions of the 2nd Zouaves, 21st Regiment, and 17th Chasseurs, and driven back to the river. But the counter-attacking troops suffered heavily when withdrawing.

Four battalions of the 1st Bavarians arrived at Goersdorf at 1 p.m., and at 2 p.m. the leading Brigade crossed the Sauer at the Old Mill and advanced over the wooded spur, which here fills the angle between the Sauer and the Sultzbach, to attack the defenders of the Froeschweiler wood. This attack could make no progress, possibly to some extent owing to the absence of artillery support, and it was found necessary to order the other Brigade of the 1st Bavarians to cross the spur, so as to gain the valley of the Sultzbach and attack the left of the 2nd Turcos, who were defending the wood most stubbornly. No ground was gained in this direction up to 3 p.m.

At 2.30 p.m., Von Kirchbach ordered a general offensive of what remained of the Vth Corps. The 17th and 19th Brigades attacked from Woerth, and the 18th and 20th Brigades from Spachbach. Ground was now gained in this part of the field. The crest of the Galgenberg was reached, the defenders being driven back towards Elsasshausen. The Woerth column also penetrated up the big re-entrant towards Froeschweiler. These successes disturbed the equanimity of MacMahon more than those of the XI Corps, possibly because they came more immediately under his observation. He consequently ordered a succession of counter-attacks, which were delivered with great vigour. The 3rd Regiment, moving South of Elsasshausen, counter-attacked towards the Galgenberg and drove the Germans back from the crest, but the French were eventually obliged to give way, chiefly owing to artillery fire. Maire's Brigade, moving North of Elsasshausen, counter-attacked towards Woerth, reaching the village, but they were driven back with heavy losses and withdrew towards Froeschweiler. Two battalions of the 36th Regiment counter-attacked towards Woerth from the direction of the Froeschweiler wood, but they also were driven back and retired into the wood. After the repulse of these counter-attacks, the Vth Corps was again able to advance, and at last, hands were joined with the XIth Corps.

Things having been quiet on the French left for some time MacMahon had called upon Ducrot to send him what infantry he could spare to Elsasshausen. Ducrot sent two battalions, 96th Regiment, and $1\frac{1}{2}$ battalions, 18th Regiment. Of these, 1 battalion, 96th Regiment, entered the Elsasshausen copse at about 3 p.m., and opened a heavy fire on the troops of the XIth Corps that were still lining the Northern edge of the Niederwald. Half the Battalion then charged and drove the Germans back into the wood, but the attack was not made in sufficient strength to gain any but a temporary success, and when the French gave way the Germans followed them up, and thus gained the Elsasshausen copse.

About the same time General Wolff led the 18th Regiment in a counter-attack from Froeschweiler towards Woerth, but met with only temporary success.

Meanwhile, Von Bose had ordered the artillery of the XIth Corps to

move forward to the Galgenberg. Crossing the Sauer at Gunstett, and moving by the Hagenau high road, they now began to arrive, and coming into action on the Galgenberg, the guns were suitably placed to support an attack on Elsasshausen at ranges of 700 to 900 yards. The guns arrived most opportunely, as another counter-attack had all but started a panic in the infantry of the XIth Corps when the French were checked by the fire of the leading batteries and their escort. Supported by the fire of their Artillery, the XIth Corps pressed on and captured Elsasshausen. The defence was supported to the last moment by 2 batteries which did not attempt to limber up till the German Infantry was within 50 yards of them. They left 5 guns in the hands of the enemy.

The artillery of the Vth Corps was also ordered forward. Some of the batteries went towards Goersdorf to try and help the Ist Bavarians, but there was little opportunity for artillery support in this part of the field. The remainder endeavoured to get through Woerth, but they were much delayed by the confusion in the streets and did not reach the heights on the right bank of the Sauer till some time after the artillery of the XIth Corps had arrived on the Galgenberg.

(iii) *The Decisive Attack.*

The crisis of the battle had now been reached. The French had been driven into a very narrow compass, and, as the German hold on Elsasshausen seemed secure, MacMahon decided to use his reserves to cover his retreat. At the same time, the German Official History says of the Germans that "the confusion and mixing up of units was so great, and the troops so exhausted, that to persevere to the end demanded all the confidence of Von Kirchbach, all the energy of the Chiefs, and the most absolute devotion of the troops."

From this time onwards the German higher commanders lost control of the battle, and could do little more than influence the troops in their immediate neighbourhood. The guns of the Vth and XIth Corps came up to within 900 yards of Froeschweiler, and all pressed on to the attack of the village which was the key of the position.

MacMahon still had at his disposal the following troops :—

Pellé's Division (which had fought at Weissenburg), 2 battalions
50th Regiment, 2 battalions 74th Regiment, 3 battalions
1st Turcos.

Septeuil's Cavalry Brigade.

Bonnemain's Cavalry Division.

Reserve Artillery, 8 batteries.

The 50th and 74th Regiments formed the garrison of Froeschweiler which had been placed in a state of defence.

As the direction of the advance of the enemy from Elsasshausen was directly threatening his line of retreat from Froeschweiler on Reichshoffen, MacMahon decided to use his reserve troops to assist the

withdrawal of the infantry by pressing back the enemy advancing from the South. First he ordered Bonnemain's Cavalry to charge the enemy in the direction of Elsasshausen. The ground was unsuitable for Cavalry action, though not to the same extent as that over which Michel's Brigade had charged earlier in the day. There could, however, be no cohesion in the charge for this reason. Bodies of Cavalry charged hither and thither East and West of Elsasshausen, and sacrificed themselves nobly. They gained a little time for the infantry, but accomplished nothing more.

Then the Reserve Artillery made an attempt to cover the retreat. The 8 batteries came into action on the rising ground just North-West of Elsasshausen, 4 batteries facing East, 2 facing South-East, and 2 facing South. The leading lines of the enemy's infantry were within 100 yards of them when they came into action. They opened fire rapidly and caused the enemy considerable losses, but at once men and horses were shot down, and the situation could not possibly last. The order was given for the guns to be withdrawn, and no less than 31 guns were safely limbered up and taken out of action, 17 being left in the hands of the enemy.

The acts of heroism of individual drivers, who with a limber and a pair of horses succeeded, with the assistance of the gunners, in limbering up the guns one by one and withdrawing them, are almost identical with those of the drivers of Q Battery, Royal Horse Artillery, at Sanna's Post. But we must remember that the one took place at a distance of 100 yards from a mass of victorious infantry, while the other was at a range of not much less than 1,000 yards. Such is the change in the effect of fire in 30 years.

After the withdrawal of the guns, MacMahon called upon the 1st Turcos for a final effort. This gallant regiment, which had fought so bravely and lost so heavily at Weissenburg, responded nobly to his appeal. They deployed behind the crest where the guns came into action, advanced and fired a volley. They retired a little disordered, but re-arranging the ranks, advanced again and charged through the leading ranks of the Germans, through Elsasshausen, driving the enemy out of the houses, through the copse, and three times attempted to reach the Northern edge of the Niederwald. But here they were brought up by fresh troops and were heavily fired on from both flanks. They were literally shot to pieces, and, retiring through the copse, reached the edge of the Grosswald, where they remained till their ammunition was exhausted, when they withdrew through the wood.

While these events were taking place, a Brigade of the Wurtemberg Division of Von Werder's Corps crossed the Sauer at Gunstett with orders from the Crown Prince to move on Reichshoffen. Hearing, however, from Prussian Officers that the XIth Corps was hard pressed about Elsasshausen, the Commander diverted his march in that

direction, and arrived in time to take part in the attack on Froeschweiler.

The attack on the French left made little progress. The 2nd Turcos offered a heroic resistance to the 1st Bavarians in the Froeschweiler wood, assisted by the 1st Zouaves. The fight was continued in the wood till 4.45 p.m., by which time the Turcos had practically ceased to exist, their losses during the day's fighting, including prisoners, amounting to the enormous figure of 92 per cent. of their officers, and 85 per cent. of their men.

The 3rd Division, IIInd Bavarians, did not reach Langensultzbach till 3 p.m., and was not seriously engaged. Ducrot however ordered the retreat of his Division owing to the collapse of the French right, and formed a rearguard on the edge of the Grosswald.

The attack on Froeschweiler was supported by 84 guns at very close range, but the village was not captured till 5 p.m. MacMahon stayed in the village till just before its capture, gave orders for the rearguard, saw it in position, and then rode to Reichshoffen, where he telegraphed to the Emperor and gave orders for his troops to make for Saverne. The French retreated in great disorder, some going to Bitche, some to Saverne, and some to Strasburg.

Lespart's Division of the Vth Corps reached Niederbroun at 4 p.m., having marched very slowly on account of the heat.

The German 4th Cavalry Division did not leave its bivouac at Shoenenburg, and was not available for pursuit. Five detachments were formed by different Corps consisting of Divisional Cavalry, Artillery, and, in some cases, Infantry. They were directed on Gundershoffen, Reichshoffen, and Niederbroun. Some insignificant captures were effected, but in no case was the pursuit carried more than five miles. Touch was lost with the enemy and the troops returned.

The losses were : French, 20,000 ; German, 11,000.

COMMENTS.

It is now proposed to comment on certain incidents and aspects of the battle in order primarily to bring out those lessons which are applicable at the present day, and to apply the teaching of our Field Service Regulations and Training Manuals to those questions which must necessarily be influenced by present-day conditions.

THE OCCUPATION OF THE POSITION.

Before considering the defects in MacMahon's dispositions, and how the distribution of the available troops might have been improved, it is necessary to draw attention once again to the ground. From Neehweiler to the Hagenau Forest, measured in a line along the crest of the Froeschweiler ridge, is a distance of some six miles, and in the space which is included between the crest of the ridge and

the Sauer there are two open areas and two wooded areas. Of these, the wooded areas could be defended with comparative ease as the event showed; the open area between Froeschweiler and Elsasshausen was strong against a frontal attack, and lent itself to a defence in depth, but was unsuitable for the action of Cavalry; while the area between the Niederwald and the Hagenau Forest was suitable for the action of the three arms in combination, and was, therefore, clearly indicated as that in which to prepare for counter-attack. This circumstance, moreover, fitted well with the strategical aspect of the defence of the position, for, as has already been pointed out, the French right flank was strategically vulnerable.

MacMahon's dispositions have been subjected to the following criticisms :—

1. They were too linear and lacked depth.
2. The troops occupied the position prematurely and before the direction of the enemy's attack could be foreseen.
3. His cavalry and reserves were unsuitably placed.
4. He had taken few if any steps to strengthen the position, and failed to utilize the strong points of the position to economize men and so increase the strength of his reserves.

To take these points seriatim :

1. Our Field Service Regulations say that " the defence must have freedom of manœuvre, which demands sufficient depth . . ." On the subject of the organization of a battlefield for defence they say further that " though the extent of ground actually held, when the direction of the enemy's advance is definitely known, must be strictly limited by the numbers available, the extent of ground reconnoitred and prepared for occupation may be larger, and should admit of various alternative distributions of the force to meet various courses of action open to the enemy."

As the late Chief of the Imperial General Staff has pointed out, in a recent Memorandum on Army Training, that at our field exercises dispositions for defence are often too linear,¹⁰ General Bonnal's views on the organization of the Woerth position in depth are especially interesting. He advocates the organization of the defence in three lines :

- (i) Langensultzbach—Eastern edge of Froeschweiler wood—Hagenau high road—Woerth—Hagenau high road—Eastern edge of Niederwald—thence towards Durrenbach.
- (ii) Neehweiler-Froeschweiler-Elsasshausen-Albrechtshausen — with Morsbronn and Forstheim held as posts in advance of the right flank.
- (iii) Niederbronn-Reichshoffen-Gundershoffen.

¹⁰ See also an article by Lieut.-Colonel Schreiber, R.E., in THE ARMY REVIEW for January, 1912, p. 121, entitled " Defensive Tactics."

It will be noticed that these dispositions, though primarily designed to meet an attack from the East, are capable of modification to meet an attack from the South-East or South, the most likely alternatives. This exactly accords with the principle laid down in the extract from the Field Service Regulations quoted above.

The suggested dispositions raise the important question of the use of advanced posts. Our Regulations place limitations on their use, stating that they are a "weakness if exposed to artillery fire which cannot be answered, and if they cannot be supported by effective infantry fire." If, on the other hand, they can be so supported, they are said to be "of value in breaking up an attack."

Bonnal's first line hardly corresponds with this conception, it being difficult to co-operate with the defence of Langensultzbach or Morsbronn from the main position, though the defence of Woerth could be assisted by artillery fire from the Froeschweiler ridge. But possibly the views of the General Staff are undergoing some modification on this subject, as the memorandum on Army Training above referred to advocates the use of advanced posts and advanced troops for the purposes of gaining time, of breaking up the enemy's attack, and of using up his troops.

Bonnal's choice of the line of the Hagenau high road in preference to the crests of the spurs between the Froeschweiler wood and the Niederwald is interesting. The field of fire, the facilities for withdrawing and exposure to the enemy's fire, are the factors in the case, and they are nicely balanced. At first sight it would appear that it would be easier to withdraw from the crests of the spurs, but Bonnal considers that the cover in the re-entrants makes them good lines of retreat, and that the passages of the river can be kept under a more effective rifle fire from the line of the road. If the line of the road is selected, however, the Galgenberg is too important a tactical feature to be left undefended.

As regards the 2nd or main line of defence, Infantry Training, 1911, Sec. 143, emphasizes the importance of occupying and strengthening localities of special tactical importance, so that they may form pivots on which to hinge the defence of the remainder of the position. The defences of these localities should be arranged so that they may give each other mutual support, and the intervening ground should be used for local counter-attacks. The tactical points in this position are Neehweiler, the high ground at the head of the clearing, Froeschweiler, the knoll between Froeschweiler and Elsasshausen, Elsasshausen, the Elsasshausen copse, the Albrechtshausserhof, point 222. The majority of these are self-supporting, but some are not. For instance, the Niederwald protrudes between the Elsasshausen copse and the Albrechtshausserhof. It will be noticed that several villages are included amongst these important tactical points, which raises the question of the suitability of villages for defence in view of the effect of modern

artillery. In this case the villages would not be subject to accurate artillery fire till the guns had crossed the Sauer and taken up positions on the right bank, no easy matter under modern conditions. The prevention of penetration between the tactical points, especially when they are not self-supporting, must be provided for either by holding the intervals or by posting suitable local reserves for counter-attack in rear of them.

Bonnal's third line in the valley of the Falkensteinerbach is a measure of precaution similar in its effect to the occupation and strengthening of supporting points in rear of an attack.

2. MacMahon's troops bivouacked on the night of the 5th August on the positions in which they fought, and thus sacrificed their power of manœuvre to a considerable extent. On this point the Field Service Regulations say: "The Cavalry must discover the direction of march and the strength of the hostile columns, and until the former is known the force should not be deployed, even when the enemy's line of advance may be foreseen. A force which is kept in hand covered by the necessary protective troops is able to assume the offensive at once if a turn in the tide of events makes this advisable." A force which is kept in hand can also meet an attack from an unforeseen direction, or retire with greater ease than one which is deployed, considerations of some importance to MacMahon. A more suitable disposition on the evening of the 5th than that adopted would have been as follows:—The 1st, 3rd, and 4th Divisions under cover of the Froeschweiler ridge in the neighbourhood of Neeweiler, Froeschweiler, and Eberbach respectively, with outposts on the Sauer from Langensultzbach to Morsbronn, and the 2nd Division, Du Mesnil's Division, such of the Cavalry as were not in touch with the enemy, and Reserve Artillery in the valley of the Falkensteinerbach, about Reichshoffen and Gundershoffen.

3. The necessity to protect the right flank has already been pointed out. If the reserves, instead of being placed immediately in the rear of the centre about Froeschweiler, had been placed as suggested about Reichshoffen and Gundershoffen they could have taken position in the morning under cover of the Forstheim ridge, where they would have had full liberty of manœuvre, and while remaining concealed, could have chosen their own time and direction for counter-attack.

4. MacMahon had done little if any entrenching, and had not even destroyed the bridges over the Sauer. Ducrot appears to have made urgent representations to him on the 5th in favour of strengthening the villages and other tactical points on the position. MacMahon, supported by all the other subordinate commanders, refused to fatigue the troops; surely a mistaken policy unless he had decided to retire, which was not the case.

The Field Service Regulations say: "The amount of preparation possible depends on the time available, which in turn depends on the

strategical situation," and for this reason Infantry Training says that "the preparation of the position for defence may have to be undertaken at the last moment, and must be of a hasty nature." But the French troops had been on the Woerth position for sufficient time to have strengthened it considerably, and a battle on the position was at any rate contemplated. The fear of fatiguing the troops, therefore, can hardly be accepted as an adequate reason for not entrenching.

The natural strength of the left of the position was not recognized by MacMahon as he allotted the defence of this flank to Ducrot's Division, the strongest numerically in the army.

RECONNAISSANCE WHEN TROOPS ARE IN TOUCH.

Von Walther's reconnaissance has been universally condemned, and the use of artillery in such circumstances has been held to have been inexcusable. Lartigue's reconnaissance was equally blameworthy, and might well have precipitated the battle, if Von Walther's had not already done so. The Field Service Regulations say that when outposts are in touch reconnaissance is limited to patrols. "Reconnoitring patrols are sent out from the outposts with the object of watching the enemy if the opposing forces are in close touch." And again "Detachments in close proximity to the enemy must be careful to avoid useless collisions."

The moral of Woerth, however, is that when troops are in close touch a Commander cannot always choose his own time for action, and that his staff must be more than usually careful to keep all subordinate commanders informed of his intentions.

ACTION OF ADVANCED GUARDS.

The action of the German advanced guards was disconnected, as was inevitable in the circumstances, and resulted in the repulse with heavy losses of a considerable proportion of three Army Corps, amounting to 17,000 men.

In considering the action of the German advanced guards it is necessary to remember that Woerth was not a battle of encounter, but was brought on by the ill-considered action of a subordinate commander against the wishes of the Chief Command. The excuse has been put forward for the German Commanders that, trained as they were themselves to the use of advanced guards and advanced troops, it was reasonable for them to expect that their advanced guards would first encounter advanced troops of the enemy, which it would be necessary for them to drive in before the enemy's position could be reconnoitred and a plan of attack formed. Had the army been on the march without the knowledge that a considerable French force was occupying the Woerth position, such a plea might be accepted. But we know that the Crown Prince expected MacMahon to concentrate his available forces and give battle on the Woerth position. Every German Corps Commander

must have known, if he had given the matter a moment's thought, that any troops which he launched across the Sauer must very shortly become engaged with considerable forces of the enemy.

Moreover, if we consider the manner in which these advanced guards became engaged, we find there is little justification for such a view. The advanced guard of the 4th Division, IInd Bavarians, advanced to attack the French left flank under the misapprehension that the French were attacking the Vth Corps. There was no idea of driving in advanced posts preparatory to a main attack.

The advanced guard of the XIth Corps was drawn into the fight by Lartigue's attempt to capture the Bruchmill. The troops composing it attacked the enemy and crossed the Sauer on their own initiative, which was not only contrary to the spirit of the orders issued by the Crown Prince, but contrary to the intention of the Divisional Commander, who wished to establish a defensive position on the left bank of the Sauer.

The 20th Brigade, Vth Corps, was on outpost, and was not an advanced guard in the ordinary sense of the term. The reasons that led Von Kirchbach to order such a small force to "occupy Woerth and the heights beyond" are somewhat obscure, as has already been explained, but it is quite possible that his motive was to gain a footing on the right bank of the river in order to facilitate the crossing of the main body of his Corps. If such was the case the task was appropriate for an advanced guard, and Von Kirchbach can only be blamed for employing insufficient forces for the purpose.

We see then that the German attacks during the early stages of the battle have little in common with the normal action of advanced guards in a battle of encounter, and that they failed because they were disconnected and made with insufficient forces. They were disconnected because the battle was entered upon against the wishes of the German Commander, who was, therefore, unable to co-ordinate the different efforts. The forces proved to be insufficient for the purposes of a preparatory action, because the French advanced line was separated by a very short space from the main position, and the second line troops were freely used to maintain the integrity of the advanced line. When all this is granted, however, it must be admitted that these attacks did something towards reconnoitring the enemy's dispositions and fixing him in his position, both of which are important functions of the troops assigned to the preparatory action.

The lesson for us appears to be that, if advanced guards are to be successful in driving in the enemy's advanced troops and reconnoitring his position, the intention of the Commander to attack must be clear, the co-operation of the different advanced guards advancing by different roads must be assured by lateral communication, and troops must be at hand to support those that are first engaged. If these conditions are absent, a succession of repulses is to be expected.

CONDUCT OF THE BATTLE BY THE CROWN PRINCE.

The Crown Prince was responsible for two errors in connection with the battle which might have had far-reaching effect. The first, in not communicating to the Commander of the Vth Corps the instructions which he issued on the 5th August to the Commander of the IInd Bavarians. This was a failure in the performance of Staff duties; its effect has been pointed out, and the point need not be laboured. The second was his order issued at 10 a.m. to Von Kirchbach "not to continue the struggle and to avoid everything that may induce a fresh one." This order, based as it was on imperfect information, placed the Commander of the Vth Corps in an embarrassing position to which further reference will be made later.

Although the sound of heavy firing was heard at Soultz at 9 a.m., it was not till 11 a.m. that the Crown Prince was persuaded by his Chief of the Staff, Von Blumenthal, to move with all haste to the scene of action. Field telegraphs and telephones and the communication service generally have been so developed of recent years that the idea prevails that the Headquarters of an Army will, in the future, be far removed from the field of battle. If we are to judge from the experiences of Manchuria, and the common practice at manœuvres, there is more than a little justification for this view. At the same time, a word of caution, based on what occurred at Woerth, may not be out of place. The report of the Officer of the Headquarter Staff sent forward by the Crown Prince left the field at 9.30 a.m. The Crown Prince received it at Soultz in half-an-hour, and half-an-hour later an order based upon it was received by Von Kirchbach. Not bad going it must be admitted, and considering the congestion which often arises in field telegraph offices on important occasions, it is doubtful whether more rapid transmission can be assured. And yet events had moved too fast to justify the Crown Prince in acting on information half-an-hour old.

If we look at the ground we find that an admirable comprehensive view of the battlefield can be obtained from the Dieffenbach ridge, and the Crown Prince would probably have been well-advised to have taken up his position there at least two hours earlier than he did. In these days the same argument applies. No doubt the position selected would be further withdrawn than that actually taken up by the Crown Prince, on account of the increased range of Artillery, and if the telegraphic headquarters were to remain at Soultz as a matter of convenience, a wire would be run forward to the position actually selected. It cannot be admitted that the communication service absolves a commander from all responsibility for personal reconnaissance.

The hurried arrival of the Headquarters on the field of battle does not appear to have contributed to clear thinking. There was

evidently much anxiety and want of knowledge as to the situation for some little time after the Crown Prince arrived, which is but natural in the circumstances. The situation, however, gradually unfolded itself as reports were received, and it then became possible for the Commander of the army to intervene with effect. The first impulse had been to order all available troops to come to the assistance of the Vth Corps, but calmer counsels soon prevailed.

The orders that were issued by the Crown Prince at 1.30 p.m. give a fair indication of the views that prevailed in the German army at the time as to the conduct of an action. It will be remembered that the Vth Corps was ordered to defer its attacks till those on the flanks could take effect; the XIth Corps was directed to continue its turning movement and make Froeschweiler its objective; while the extreme flanks, the IIInd Bavarians and the Wurtemberg Division, were directed on a point well in rear of the French position, namely Reichshoffen. That neither the IIInd Bavarians nor the Wurtemberg Division ever reached Reichshoffen was only a failure in execution. The idea underlying the order was evidently envelopment of both the enemy's flanks, and the delaying of the attack of the Vth Corps seems to contain the germ of the theory of simultaneous pressure. The troops held in hand were one Division of the Ist Bavarians, the 4th Cavalry Division, and the Baden Division, the last-named being specially told off to protect the left flank. There is nothing here indicative of the preparatory action along the whole battle front, to be followed by the decisive attack at a selected point, which is the underlying principle of our Field Service Regulations.

It is interesting to note how the envelopment theory miscarried on this occasion. The IIInd Bavarians were in no condition to attack, and a Brigade of the Wurtemberg Division, after crossing the Sauer at Gunstett, is said to have been diverted from its objective by appeals for assistance from the XIth Corps, and moved on Froeschweiler. Not a man moved in the direction of Reichshoffen.

The Crown Prince must be held responsible for the failure to make use of the Cavalry during the battle, and for the total absence of energetic pursuit. Cavalry, as the reserve of the army in an offensive action, is foreign to all our ideas on the subject. The outer flank of the XIth Corps in the Rhine plain was the obvious position for the 4th Cavalry Division, and further reference will be made to this subject.

THE CONDUCT OF THE BATTLE BY MARSHAL MACMAHON.

Several points in MacMahon's generalship have already been referred to. His failure to concentrate his available forces, his decision to fight on the Woerth position, the distribution of his troops, his failure to provide for the protection of his right flank, and the

position of his reserves. There remain some few points still to be discussed.

The position occupied by MacMahon during the battle was under a walnut tree near the road leading from Elsasshausen to Woerth. The view of the battlefield from this position differs materially from that which could be obtained from the position taken up by the Crown Prince on the opposite bank of the Sauer. The one is as circumscribed as the other is comprehensive. The Niederwald and the Froeschweiler wood blot out all view of the flanks. No doubt MacMahon's absorption in the task of repelling the attacks of the Vth Corps was largely due to this fact. He would probably have obtained a more comprehensive grasp of the events that were taking place if he had selected a position a little further removed from the scene of the actual fighting on the crest of the ridge between Froeschweiler and Elsasshausen.

If MacMahon was wrong to accept battle at Woerth, should he have broken off the engagement if a favourable opportunity occurred? It is easy to be wise after the event, and no doubt either at 11.30 a.m., or at 2.30 p.m., he could have broken off the fight and withdrawn his army with considerable credit to himself and his troops. They had inflicted heavy losses on the Germans, and inspired them in all probability with a wholesome respect for their fighting capacity. Ducrot's Division had not been seriously engaged and could have covered the retreat of the army.

On this question the French Official History quotes a passage from Montholon's "Memoirs of Napoleon" dealing with a similar incident, which is so appropriate that it will bear repeating:

"Des observateurs d'un esprit ordinaire diront qu'il eût dû se servir de l'aile qui était encore intacte pour opérer sa retraite et ne pas hasarder son reste. Mais avec de tels principes, un général est certain de manquer toutes les occasions de succès et d'être constamment battu. La gloire et l'honneur des armes est le premier devoir qu'un général qui livre bataille doit considérer. Le salut and la conservation des hommes n'est que secondaire, mais c'est aussi dans cette audace et dans cette opiniâtreté que se trouve le salut and la conservation des hommes. La conduite de Condé est donc à imiter. Elle conforme à l'esprit, aux règles et aux cœurs des guerriers. S'il eut tort de livrer bataille dans la position qu'occupait Mercy, il fit bien de ne jamais désespérer tant qu'il lui restait des braves aux drapeaux."

That is the spirit which animated MacMahon, to whom all honour is due for his determination and the heroic resistance offered by his troops against overwhelming odds.

We must admit, however, that he failed to co-ordinate the offensive efforts of his troops. Admirable as were many of the counter-attacks as regards the method of their execution, it is certain that his

resources were thereby frittered away. The counter-attacks were all local in character, they were mostly directed against the frontal attack of the Vth Corps, which was the least promising direction, and no concerted effort was made against the flank of the XIth Corps, although there can be little question that suitable opportunities were offered. An attack directed against the flank of the Morsbronn column might have paralysed the turning movement, and an attack against the flank of the XIth Corps, when they emerged from the Niederwald, might have had far-reaching results. But the assembly of a strong general reserve for a great counterstroke was no part of MacMahon's plan, and he appears to have aimed solely at repelling the onslaught made on his position.

Lastly, there is the question of the employment of his cavalry. They were unsuitably placed, used on unsuitable ground, and their action was confined to self-sacrificing efforts to cover the infantry retreat. To this subject we will return later.

THE FRONT ON WHICH THE BATTLE WAS FOUGHT.

The subjects dealt with up to now all involve questions of principle, in the consideration of which the value of the lessons of the past can hardly be gainsaid. The front on which a force of a given size can fight under modern conditions is a subject on which there is room for speculation and difference of opinion. At Woerth the French fought with 46,000 men on a front of somewhat less than four miles. Or, in other words, 11,500 men to a mile, or between 6 and 7 men to a yard. Yet they certainly had not too many men for the position, in fact, their reserves were weak.

The Vth Corps attacked on a front of 2,200 yards, or 10 men to a yard, and they were used up to the last man. The XIth Corps attacked on a front of 7 men to a yard, and by the time they reached the Northern edge of the Niederwald, there were only 3 Battalions left in reserve.

The lesson of Woerth is the necessity for depth in the distribution of the troops for battle, both in attack and defence, and it would be most unwise to ignore it. Yet a very marked tendency to over-extend the front has been noticeable in our manoeuvre training, and has elicited unfavourable comment from the late Chief of the Imperial General Staff.¹¹

This over-extension of the front has perhaps been due to a variety of causes. Firstly, in some cases a confusion has existed between the undoubted necessity for infantry to extend when advancing under fire, and the extension of the front on which a force of a given size can fight. The former has been conclusively proved by all recent experience, but it is no excuse for the adoption of exaggerated ideas with respect to the latter.

¹¹ Memorandum on Army Training, 1909, page 5 ; also 1910, page 5.

Then there was a misreading of the most recent lessons of South Africa and Manchuria.

The front was unduly extended in South Africa on account of the exceptional conditions. The Boers were all mounted. When attacked and threatened with envelopment by superior numbers, they used their mobility to prolong the line and prevent envelopment. They were content to maintain their position, and seldom or never aimed at decisive results by means of counter-attack. Their mobility enabled them to escape the natural consequences of such tactics, which would have overtaken a force composed principally of infantry.

Manchuria was conspicuous for bad communications, which enabled the lines of operation to be foreseen some time beforehand. The Russians, who usually fought on the defensive, were thus able to employ field fortification to a very large extent. Men were economized, and the front considerably extended, without risking penetration unduly.

Lastly, there is the effect of manœuvre training in peace time. The necessity for depth is not apparent at manœuvres. The front line seldom gives way, and if it does so by order of an Umpire, its recuperative powers are usually remarkable. There is an absence of disorder amongst defeated troops, and there is no loss of *moral*. On the other hand, the effect of envelopment is at once apparent. Possibly, for these reasons, there is a decided temptation to over-extend and dispense with reserves at manœuvres.

The Field Service Regulations, however, give us a valuable guide, and lay down that "a smaller force than 3 to 5 men per yard on the front on which the decisive attack is to be delivered will rarely prove sufficient, this force being distributed in such depth as circumstances make advisable."¹²

The increased power of the modern rifle has been used as an argument for a great reduction of the number of men employed on a given front, provided that a sufficient volume of fire is developed. But we have not yet reached a point at which we rely on fire alone, and the basis of our conception of the modern fight is the attainment of fire superiority as the necessary preliminary to the assault with the bayonet. As long as this conception holds the field, the value of numbers at the decisive point cannot be ignored.

THE ASSUMPTION OF RESPONSIBILITY BY THE GERMAN COMMANDERS AND THEIR LOYAL CO-OPERATION.

Although the German Commanders were not provided with a system of communication such as we have at the present day, they frequently communicated with one another, as well as with Headquarters, and they were imbued with the doctrine of full assumption

¹² Field Service Regulations, Section 104.

of responsibility and loyal co-operation one with another. The result was that, although there was every excuse for hesitation and inaction during the early hours of the battle, the evil results of the irregular manner in which the action started were reduced to a minimum.

The Commander of the Vth Corps renewed the attack on his own responsibility. The flanks then broke off the engagement in accordance with orders from the Crown Prince, but when called upon by the Commander of the Vth Corps to renew the action, the Commander of the XIth Corps agreed to do so as soon as he was fully informed of the state of affairs. Von Kirchbach put aside the order of the Crown Prince to break off the fight. But the circumstances demanded the exercise of his own judgment. The guiding rule of conduct in such cases is stated in Field Service Regulations, Section 12, to be: "A departure from either the spirit or the letter of an order is justified if the subordinate who assumes the responsibility bases his decision on some fact which could not be known to the Officer who issued the order, and if he is conscientiously satisfied that he is acting as his superior, if present, would order him to act."

Henderson quotes the ruling of the Duke of Wellington in a similar case:—"Major-General Wellesley thinks it proper to explain to the troops that there is much difference in the situation and cases in which an Officer is permitted to exercise his discretion. It very frequently happens that an order may be given to an Officer, which, from circumstances not known to the person who gave it at the time he gave it, would be impossible to execute, or the difficulty or risk of the execution of it would be so great as to amount to a moral impossibility. In a case of this kind Major-General Wellesley is by no means disposed to check Officers detached in the exercise of their discretion; but Capt. s case is not of this description; he could have had no information which the officer had not who gave him his orders, and it was his duty to obey." Here, then, we have a principle which has survived a century of war without any modification whatever.

While, however, Von Bose's action in engaging the full strength of his Corps at the request of Von Kirchbach is highly to be commended, and the assumption of responsibility by Von Kirchbach in ignoring the orders of the Crown Prince was fully justified, there were several instances during the day of the abuse of initiative.

The action of Von Walther and Lartigue in conducting reconnaissances in the early morning has already been discussed and condemned.

The passage of the Sauer and the attack of the Niederwald by the advanced guard of the XIth Corps was undertaken on the initiative of the officers with the troops, was contrary to the intention of their Commander, and, though excused by the German Official History on the grounds that the troops could not remain where they were,

and that it was better to go forward than back, was hardly justified by the circumstances.

Von Schkopp's action in diverting his Brigade from the line of march assigned to it, and sending only a portion of his Command to Gunstett when ordered to form the reserve, while he persevered with the remainder and such troops as he could collect, is also excused by the German Official History on the grounds that Von Schkopp could not send back the 94th Regiment, which was engaged with the enemy near Durrenbach. This is a fiction, as the Regiment was not engaged at the time, and Von Schkopp was guilty of an act of indiscipline, which should not be condoned simply because it had very happy results.

Finally, the Commander of the Wurtemberg Brigade received orders from the Crown Prince to move on Reichshoffen after passing the Sauer at Gunstett, obviously with the intention of completing the envelopment of the French right flank and operating against their line of retreat. We have seen how again the German Official History endeavours to excuse this Officer for going to Froeschweiler by saying that he was appealed to by Prussian Officers to go to the assistance of the XIth Corps. Such an excuse would not hold by the light of our Field Service Regulations, or the ruling of the Duke of Wellington. The Crown Prince must have known that the XIth Corps must inevitably become hotly engaged near Elsasshausen when he issued his order to the Wurtemberg Brigade, and it was the duty of the officer in command to comply.

We see, therefore, both the good and the evil effects of the training of officers to assume responsibility. It is not every officer's judgment that can be trusted. But the lesson of Woerth undoubtedly is that the good greatly outweighs the evil.

THE COMBINATION OF HOLDING ATTACKS AND TURNING MOVEMENTS.

The term "holding attack" has been expunged from our Training Manuals as liable to be misinterpreted. Troops ordered to attack are invariably to attack with the utmost vigour, as it is recognized that no mere demonstration will hold the enemy to his ground and use up his reserves so that the decisive attack may have full effect. In Field Service Regulations, Section 103, it is said "the term decisive attack does not imply that the influence of other attacks is indecisive, but rather that it is the culmination of gradually increasing pressure relentlessly applied to the enemy at all points from the moment when contact with him is first obtained." And again, "the general principle is that the enemy must be engaged in sufficient strength to pin him to his ground and to wear down his power of resistance, while the force allotted to the decisive attack must be as strong as possible."

These principles, so far as they apply to the conduct of a holding attack, are admirably illustrated by the battle of Woerth. The attacks

of the Vth Corps were made with the utmost vigour, and they used up the French reserves continuously throughout the day. Every fresh attack drew in fresh troops to counter-attack, till ultimately Von Kirchbach, with the approval of the Crown Prince, did not hesitate to put in his last battalion. The vigour of these attacks monopolized MacMahon's attention and diverted his mind from the importance of the turning movement of the XIth Corps. If the Vth Corps had contented itself with a mere frontal demonstration, can it be supposed that MacMahon would not have concentrated his reserves against the XIth Corps, and who can say what might have been the result of the battle if he had done so?

Again, the attack of the XIth Corps against the Morsbronn ridge illustrates the same principle. The columns that crossed the Sauer at Spachbach and Gunstett, and attacked the Niederwald and the Albrechtshauserhof, fully occupied the attention of Lartigue. These attacks were pressed with determination; they were supported by a great mass of artillery; and they drew in and used up the French reserves. When the turning movement through Morsbronn developed, there were few troops left to meet it, and the full effect of an enveloping attack was felt at once. As we have seen, the position could not be maintained without a counter offensive, for which inadequate troops were available.

Here then is a lesson of abiding value, but it is not possible to leave this subject without referring again to a point which has already been discussed. The extracts quoted above from the Field Service Regulations foreshadow a decisive attack as a separate act. It is true that in one passage it is described as the "culmination of a gradually increasing pressure," but in the preceding sentence it is said that "a force must be held in readiness to deliver the decisive attack, while the remainder is employed to develop the attack, and to wear down the enemy's power of resistance." Woerth was not fought on this principle. In the description of the battle the final attack on Froeschweiler has been termed the "decisive attack." The only fresh body of troops that took part in this attack was the Wurtemberg Brigade, which had certainly not been kept in hand for the purpose. If the Crown Prince's orders had been complied with the attack on Froeschweiler would have been carried out solely by the already exhausted infantry of the Vth and XIth Corps, and the principal object of these orders, as has already been explained, appears to have been to ensure simultaneous pressure by strong bodies of troops enveloping both flanks.

The above must not be taken as an adverse criticism of our Regulations, but merely as an example of a difference in doctrine.

BREAKING UP FORMATIONS IN THE DEPLOYMENT AND THE MIXING
OF UNITS IN THE FINAL STAGES.

One of the principal features of the battle was the confusion which arose in the ranks of the attacking infantry during the later phases. This is attributed by most writers on the subject to the breaking up of the organization of the Divisions, Brigades, and Regiments in the initial deployment. This was again due to the haste with which the troops were thrown into the fight. The principal example was in the XIth Corps. The manner in which both the advanced guard and the main body of the Corps were brought into action has been fully explained in the description of the battle, and it is not necessary to repeat the details. It will suffice to point out that the confusion, which eventually arose, might possibly have been less if the initial deployment had taken place with less haste and more regard for the preservation of the control of the subordinate commanders.

The French Official History considers that the mixing of units in the final stages was largely attributable to the undue initiative allowed to the company and section officers during peace training. Each was eager for distinction, and made full use of the initiative allowed to him to press forward in any direction that seemed to him best at the moment. Portions of the same company thus frequently diverged from the original objective. If this is a legitimate criticism, then this mixing of units is likely to be aggravated rather than reduced in the battles of the future, for it is certain that modern conditions demand increased exercise of initiative, not only from officers, but from individual soldiers. At any rate the lesson of Woerth is that, while every step should be taken to minimize this evil, it is one that must be reckoned with, and that any tactical theories which ignore it are not likely to prove practical in war. The only way to reduce the confusion that must inevitably arise is to insist, as does our Infantry Training, on the necessity for re-forming the ranks after the capture of every locality. Bonnal quotes three examples of this in the XIth Corps. The troops that captured the Albrechtshauserhof were in the act of re-forming when they were counter-attacked by the mixed units of Lartigue's Division. They were again thrown into confusion. Von Schkopp's column was re-forming after passing through Morsbronn when the charge of the Cuirassier Brigade took place. Again, later, after moving up the Eberbach valley and passing the Western end of the Niederwald, the 94th Regiment of Von Schkopp's Brigade re-formed, and it was largely due to the renewed order in the ranks of this Regiment that the counter-attack of the 1st Turcos was repulsed.

It is impossible to read the official histories without being struck by the fact that the German Corps Commanders frequently issued orders

to Brigades over the heads of the Divisional Commanders. In fact, as soon as the Corps were committed to action, they seem to have fought by Brigades and not by Divisions. These remarks of course apply only to the Prussian Corps, as the two Bavarian Corps only had one Division of each Corps engaged. But the fact remains that a Corps of two Divisions of two Brigades each is not a very handy organization on the battlefield, and is almost bound to tend to the suppression of the Divisional Commanders. These officers can have had no very clearly defined duties throughout the day in either the Vth or XIth Corps.

CONDUCT OF THE FIRE FIGHT.

Henderson considers that the weapons used in 1870 "at once brought into prominence the characteristic which makes all fighting from 1870 onwards so different from the fighting of any previous war. The attainment of superiority of fire became the decisive factor, and the assault with the bayonet lost the importance which had hitherto belonged to it." Our Regulations have for many years looked upon the attainment of superiority of fire as the necessary preliminary to a successful assault, but we still look to the assault as an essential element in the fight, and do not believe that a stubborn enemy can be shot out of his position. At the same time, the conduct of the fire fight has undergone considerable modification since 1870.

The Germans at Woerth deployed and moved forward with the leading line in "line of company columns at deploying interval." No extension took place till the effect of rifle fire made this necessary, when each company threw out a line of skirmishers of about one-third of its strength, the remainder advancing in column of sections.

The second line advanced as a rule in "line of company columns at deploying interval," but these columns usually deployed when they came under heavy fire.

In some cases there was a third line, while in others there was not.

Losses began to be felt at about 900 yards, but the attackers were usually able to advance to within 500 yards without halting or firing. They then occupied a fire position,¹³ and entered on a struggle for fire supremacy. If they were successful in this, the further advance was not as a rule accompanied by much difficulty or loss. They were frequently counter-attacked and driven from their fire position, and were seldom successful in establishing fire superiority till they were closely supported by their Artillery. The Germans were trained to the use of volleys and "file firing" or independent fire, but it is clear that the officers very soon lost control, and that "file firing" was the rule and not the exception. The men also frequently fired on the move,

¹³ There was an essential difference in the ways in which the French and Germans formed a firing line. The French skirmishers fell back and withdrew through gaps in the line which was formed behind them. The Germans moved up into line with their skirmishers, who were absorbed in the firing line.

and seldom lay down to fire, most of the fire being delivered standing. The following extracts from Regimental Histories are quoted by Henderson : " The officers gave the signal to advance, and the whole line of skirmishers went up the hill with hurrahs, and a fabulously rapid fire." " I saw no enemy in our front, but we kept up uninterruptedly a very hot fire." " Then, however, the enemy's line all at once turned about and ran away ; we followed, shouting hurrah, and firing all the time." It is clear from these extracts that there was much excitement and not much control of fire.

There is room for much speculation as to the best manner in which to conduct an advance and attain the necessary fire superiority on the modern battlefield. Since the days of Woerth, although the theory of fire superiority remains the same, improvements in weapons have greatly modified methods, and it is in this domain essentially that it is necessary to keep abreast of improvements and to endeavour to forecast their effect.

To state our present-day theory in a few words—we admit no normal formation in attack, and insist on formations being suited to the ground—we recognize the necessity for extension when moving under fire, but we endeavour to remain in formed bodies as long as possible so as to facilitate control of movement—movement under fire is made by rushes, the number of men making a rush and the length of the rush being dependent on the volume and effect of the enemy's fire—we use fire primarily to support movement—our object is to build up a firing line in close proximity to the enemy in order that we may ultimately be able to deliver a successful assault—in order to control the expenditure of ammunition and to make the fire as effective as possible and ensure a suitable distribution, we endeavour to maintain an effective control of fire throughout.

The application of this theory to different cases is capable of infinite variety. Let us endeavour to apply it to a single case, say the first attack of the 20th Brigade, Vth Corps, on the Galgenberg. We will assume that 2 columns of 2 battalions each are allotted to the attack, one moving through Woerth and the other through Spachbach, as was the case. An examination of Map I and Panoramas shows that the Western slopes of the Dieffenbach ridge are fully exposed to artillery fire from the Froeschweiler ridge, and that there is very little cover on these slopes. It will be necessary, therefore, for the battalions moving on Woerth to deploy under cover of the ridge. Those moving on Spachbach have a covered approach for some distance through the Fuchshübel wood. We must now examine the ground with a view to the selection of possible fire positions. The first that presents itself on the Spachbach line of approach is the line of the Goersdorf-Spachbach road, which is about 1,200 yards from the nearest point of the enemy's position on the Galgenberg—then comes the river bank—then the meadows must be crossed before the railway is reached—then comes

the Hagenau high road, which forms a peculiar elbow at this point—shortly afterwards dead ground is reached at the foot of the hill. On the Woerth line of approach there is no fire position for infantry till the Western outskirts of Woerth itself are reached, and after debouching from the village, the road to Elsasshausen immediately climbs the Western slopes of the Galgenberg.

Before launching the attack there are various points for the Commander to consider—the attacks will be separated and must be properly timed so that they are not beaten in detail—artillery support—the use of his machine guns. The Spachbach column has further to go and the more difficult ground to traverse in the later stages. This must be allowed for. Artillery support will be dealt with later. Some machine guns should be established as soon as possible on the line of the Goersdorf-Spachbach road, and if a suitable approach to a good position could be found, it might even be desirable to mass the guns of the Brigade there to begin with. The first advance would be made with the object of gaining access to Woerth and Spachbach, and establishing a suitable force, say $\frac{1}{2}$ battalion from the Spachbach column, on the line of the Goersdorf-Spachbach road to cover the further advance with fire. This advance, being through a zone swept by the enemy's artillery fire, would be made as rapidly as possible, the formation being that considered least vulnerable to artillery fire. The Woerth column would push on through the village and establish a firing line on the Western outskirts.

During the progress of the attack the fire of each column must be directed so as to assist the progress of the other. This requires careful pre-arrangement. The Woerth column could establish a strong firing line and some machine guns in the South-Western outskirts of the village, and by concentrating fire on the South-Eastern slopes of the Galgenberg, would be able materially to assist the advance of the Spachbach column. This column must cross the river under artillery and long range rifle fire. The operation will be difficult, and Engineers must make the necessary bridges. As soon as they are completed, an effort must be made to cross the meadows as rapidly as possible till the line of the railway is reached. In order to carry out this operation with success, covering fire from guns, machine guns, and rifles is essential, including the support of the Woerth column already alluded to. Provision must be made to protect both flanks of the attack, the firing lines must be gradually reinforced, and a further advance begun, again supported by fire till a footing is gained on the slopes of the hill. Both columns would now concentrate their fire on the Galgenberg and commence short rushes over the open ground, which lies between the position and the Hagenau road, supported by overhead fire. The rushes would, wherever possible, be made to cover over dead ground. Artillery support is now a vital factor, for, if it is efficient, the defenders will have great difficulty in firing on the leading lines,

and it may be possible to assemble gradually under the crest of the hill a sufficient force to deliver a successful assault. The reserves moving on behind will strengthen and hold all supporting points in rear of the attack.

If a successful assault is delivered, the assaulting troops will at once come under a converging artillery fire and be liable to counter-attack. The moment is critical, and every effort must be made to re-form the ranks and dispose the troops to hold the ground gained.

Such, in outline, might be the various stages of an infantry attack over such ground under present-day conditions.

WOOD FIGHTING AND ATTACKING THROUGH WOODS.

Woerth is prolific in instruction on the subject of wood fighting, and brings into prominence the difficulties entailed and the characteristics and training of the troops necessary for success.

The advance of the 4th Bavarian Division through the Langensultzbach wood, and their ineffectual efforts to cross the clearing and drive the French from the Northern edge of the Froeschweiler wood, have already been recounted in some detail. Many mistakes were made that might have been avoided. The officers of the 7th Brigade either could not read their maps or mistook the spire of Neeweiler church for that of Froeschweiler, and entered the wood in the wrong direction. The Brigade was deployed on much too broad a front for adequate control to be maintained, while moving through such an extensive wood. When fire was heard to the South-East, the troops thought that their rear was threatened, and at once swung to their left. By the time they arrived at the South-West corner of the wood and came under fire, all cohesion had been lost. When eventually a firing line was formed on the edge of the wood the units were much mixed up. It was impossible to exercise control, and no concerted effort could be made to advance across the clearing. The partial efforts of a few hundred men all failed, no doubt on account of the superiority of the French fire. There was no artillery support, and when counter-attacked on the flank, the troops gave way in disorder. The line was unduly extended, and there were no supports in rear of it.

It may be that the Bavarian troops were neither so well trained, nor so well commanded, nor such stubborn fighters as either the Prussians or the French, but, making due allowance for any inferiority in their fighting capacity, the operation which they attempted to undertake was one of exceptional difficulty. Infantry Training lays down that: "When a wood intervenes between an attacking force and the defenders it may serve as a useful avenue of approach provided it is possible to deploy on the far side without exposure to fire at effective range. When, however, the attackers on reaching the far side come at once under the effective fire of the defence, they suffer from considerable

disadvantages. It may be difficult to deploy in the wood, to maintain control, and to arrange a concerted effort for a further advance. Artillery may be unable to assist, and it may be difficult to find supporting positions in the event of counter-attack. In such circumstances the advantages of a covered approach may be overbalanced by these disadvantages, and it may be better to seek another line of advance."

Bonnal is of opinion that the approach march through the wood was very faultily conducted, that too large a proportion of the force was deployed, in the first instance, on too broad a front, that the first step should have been to occupy Langensultzbach securely, and that an advanced guard should have been utilized, the first objective of the attack being the North-East corner of the Froeschweiler wood. He sums up his comments as follows :—

"An approach march through a wood may be very dangerous if the flanks are not well protected.

"The dispositions should be similar to those that are suitable for night operations.

"Troops that advance through a wood in approach formation should be of excellent quality.

"The companies deployed on the edge of a wood are never in hand, and it seems to be necessary to assemble them before launching them in the open against an enemy that faces them.

"The direction of a fight on the edge of a wood is difficult, owing to the almost inevitable mixing of units.

"The edge of a wood favours the defence if it is a question of repelling an attack that is insufficiently prepared or is feeble.

"Woods inspire an instinctive fear in the attacker, even when they are only lightly defended, for the man who attacks dreads above all the danger which he suspects but does not see.

"Finally, history has not yet recorded a single great attack which has debouched from a forest or an extensive wood.

"This is not surprising, for if woods are extremely valuable for approach marches which precede engagements on the whole extent of the front of battle, they only exceptionally permit of the intimate combination of the three arms, without which it is not possible to prepare or to produce decisive results."¹⁴

The fighting in the Niederwald and the Froeschweiler wood shows the value of opposing an advance through a wood in order to break up an attack before it debouches. The opposition offered by the 3rd Zouaves to the greatly superior forces of the XIth Corps in the Niederwald completely disorganized the Infantry of that Corps, deprived it of offensive power for some time, and left it in a condition that invited counter-attack. The resistance offered by the 2nd

¹⁴ Writer's translation.

Turcos and other units to the 1st Bavarians in the Froeschweiler wood prevented all but a small portion of the troops of that corps debouching from the wood and taking part in the attack on Froeschweiler.

The French have claimed considerable superiority in this form of fighting, particularly for their Algerian troops, the Zouaves and Turcos, and their claim appears to be fully justified. They attribute their superiority to the fact that these troops had considerable experience of fighting, and that they were consequently self-reliant, resourceful, and imbued with initiative. They had been trained to fight in groups, and men that became separated from their own companies or sections rallied to any officer or non-commissioned officer in whose neighbourhood they happened to find themselves. They, moreover, constantly assumed the offensive, and made good use of the bayonet as well as of the rifle.

Surely there are valuable lessons to be learnt from these incidents that are applicable at the present day. The value of the long range of modern weapons must be considerably reduced in wood fighting, and that of the bayonet correspondingly enhanced.

COUNTER-ATTACK.

Though no great counterstroke by a force kept in hand for the purpose, and designed to win the battle, took place at Woerth, surely no battle is more prolific in instances of local counter-attacks. The first point to consider in connection with them is their nature and object, and the second their method of execution.

Assuming the crest of the Froeschweiler ridge to be the main French position, all the counter-attacks were made in front of this position. The great majority were made to keep the enemy at a distance from it, to drive back his attack, in fact, before it could get at close grips with the main line of defence. A minority were made to cover the withdrawal of beaten troops, such as Lartigue's counter-attack on the Albrechtshauserhof, the counter-attack of the 1st Turcos, and the two cavalry charges.

Such counter-attacks as the majority of those delivered by the French, use up the attacker's troops and draw fresh troops into the fight, but they also use up the troops of the defence, which, if we are to judge from Woerth, as a rule suffer heavily in withdrawing, particularly if they are courageous and press their attacks too far. If the French counter-attacks used up every available man of the Vth Corps, it must be admitted that they also exhausted MacMahon's reserves.

There is another type of counter-attack, namely, that which is reserved till the enemy captures an important tactical point in the position, when it is launched for the limited purpose of recapturing the point that has been lost. Or, if the enemy penetrates between

two tactical points and is thereby threatening to envelop one or both, a counter-attack may be launched to prevent such penetration or envelopment.

The French recognize the distinction and give different names to the two types—namely, “*contre-attaque*” and “*retour offensif*.”

Our Field Service Regulations advocate both types :

Local counter-attacks will be made to “drive back the enemy’s firing line so that the enemy may be forced to use up his reserves to restore the battle;” and, again, “if an enemy succeeds in penetrating the position at any point a local counter-attack should be launched against him.”

The former type is the more strongly emphasized of the two, yet we seldom or never practise it. What is the reason? Can it be that we are instinctively sceptical of its value under modern conditions?

There is no question on which it is more difficult to extract the true lessons of Woerth than this question of the value of the local counter-attack, delivered in front of the main position for the purpose of using up the enemy’s reserves. The exhausting process was on this occasion reciprocal, and the French cannot be said to have gained any advantage from many of their local counter-strokes. The unanimous opinion of all commentators consulted by the writer is that they would have done better to have husbanded their reserves for the assumption of the offensive in greater force in a direction that would have been more telling.

Counter-attacks to cover the withdrawal of beaten troops are a necessity, but the employment of the whole available cavalry force for this purpose raises questions which will be discussed later.

The method of execution of the French counter-attacks must now be referred to. As a rule, the troops formed line and advanced till within full view of the enemy at short range, when they fired a volley or two and charged with the bayonet. The front line was seldom supported by a second line, and artillery support was usually wanting. The attacks were nearly all frontal, the troops were impetuous and followed up too far, losing heavily in withdrawing, and nothing but a local and temporary success was gained.

One of these counter-attacks will be described in some detail as an example, namely, that delivered by Lartigue’s Division against the portion of the advanced guard of the XIth Corps which crossed the Sauer by the Gunstett bridge.

At 9.30 a.m. the 2nd Battalion, 50th Regiment, belonging to the Vth Corps, which had been on outpost, was reinforced by the 11th Chasseurs of the advanced guard of the XIth Corps. These two battalions engaged the 1st Chasseurs (French), which lined the high road, in a fire fight across the river. At 10 a.m. the 11th Chasseurs crossed the bridge, covered by the fire of the 4 batteries on Gunstett

Hill and the fire of the 50th Regiment, and advanced to the attack of the 1st Chasseurs. Owing to the superiority of the German Artillery, the French gave way in the direction of the Albrechts-hauserhof, followed by the Germans. Lartigue then directed the 1st battalion 3rd Turcos and 2 companies 2nd battalion 3rd Turcos to descend the Morsbronn ridge and attack the enemy's left flank. The 1st Chasseurs turned about and assumed the offensive at the same time, the whole movement being supported by 2 battalions 56th Regiment in second line. Being under a heavy artillery fire, which their own artillery was powerless to subdue, each battalion formed in line, and escaped heavy casualties from this cause. The Germans retired in great disorder over the bridge followed by 200 or 300 Turcos, who ran in pursuit of their adversaries towards Gunstett. The Turcos now came under a heavy fire from the 87th Regiment posted in the vineyards at the South-West corner of Gunstett Hill, and from the 80th Regiment in occupation of the outskirts of the village, and were obliged to retire suffering heavily. They re-crossed the bridge, but held on for some time in the hop gardens in its neighbourhood.

This counter-attack was admirable as regards the combination of the frontal and flank attacks, the support of a second line, and the suitability of the formations adopted. Efficient artillery support was unfortunately wanting, and the Turcos were too impetuous—they should have contented themselves with driving the enemy over the river. Troops that have been hunted back, as the 11th Chasseurs were on this occasion, need not be reckoned with seriously for many hours.

The question arises, what modifications of method would be necessary at the present time? There is the same necessity for striking the flank, for depth and weight in the attack, and for artillery support, but we now rely primarily on fire and not on the bayonet. In comparison with an ordinary attack the front line would extend less, the rushes would be quicker and longer, the pauses for fire shorter, and the supports would be closer up and would reinforce and carry the front line on at the slightest check. The whole movement must be carried through with rapidity, confidence, and dash, or it will very probably fail.

EMPLOYMENT OF ARTILLERY.

There can be no question that the methods employed by the German artillery at Woerth with so much success require considerable modification at the present day. We have reached, therefore, the realm of speculation, and, in this connection there is comparatively little to be learnt from the lessons of the battle that is applicable to our own time. It is true that the necessity for the close co-operation of the artillery and infantry is as imperative as ever, but the methods by which it is attained differ widely in many essential details.

The German artillery had failed in 1866, and great attention had subsequently been paid to questions of artillery tactics. The theory that had been evolved by the German General Staff may be summed up as follows :—

Artillery marched well forward in the columns. They deployed early in the greatest possible strength. The batteries advanced simultaneously into action and opened fire simultaneously.

The first object was to use the full force of the artillery mass to overwhelm the enemy's artillery in an artillery duel. If the enemy opposed a similar artillery mass it must be destroyed ; if not, each portion of the enemy's artillery must be engaged by superior force and destroyed in turn. When this had been accomplished, the guns would be free to prepare and support the infantry attack.

These tactics were well suited to the artillery of the time, which, it must be borne in mind, used black powder, and had to see over the sights to develop effective fire. To see, in fact, was to be seen. They were exemplified by the Artillery of the Vth Corps at Woerth, though it must be admitted somewhat imperfectly. As we have seen, the batteries could not deploy and advance simultaneously into action, owing to the heavy state of the ground. They advanced down the Dieffenbach-Woerth road and turned off to either side taking three-quarters of an hour to get into action. As the enemy did not employ the tactics of the artillery mass, they were not in a position to take advantage of this somewhat dilatory deployment. The French had only one Brigade of artillery with each Division, of which one battery was armed with machine guns. The remainder were called Reserve Artillery, and only 6 batteries of the Reserve deployed against the massed batteries of the Vth Corps.

The German guns were able to concentrate their fire in turn on the different groups of the French artillery, and naturally got the best of the encounter. After 40 minutes of this unequal contest the French guns withdrew, but it must be noted that they were not by any means destroyed. According to the French Official History, the Commander of the Reserve Artillery realized that it would not serve any useful purpose to prolong the duel, and he was afraid that he would run short of ammunition before the infantry fight began in earnest. He accordingly ordered the batteries to retire, and they were subsequently able to intervene again and again in the action.

Although but imperfectly exemplified, it must be admitted that the tactics of the massed artillery had been fully justified. The German guns now dominated the situation in the centre of the battlefield, and were able to render the further interventions of the French artillery of comparatively little account, and to devote their attention to the support of their infantry or to repelling the many counter-attacks of the French infantry.

If these tactics were so successful, why should they be discarded ?

The answer is that the improvements in modern artillery have profoundly modified the conditions. The range and rapidity of fire of the guns have been greatly increased, smokeless powder enables guns to remain concealed when in action, and appliances for indirect laying enable effective fire to be developed from behind cover against all but rapidly moving targets. If the battle were to be fought again, and the Germans were to employ the same tactics, the result would be very different. The German guns, while fully exposed, would have no clearly defined target. The French would deploy a sufficient number of batteries for their purpose under cover of the Froeschweiler ridge, and, while practically immune from effective fire themselves, would very soon make matters extremely hot for the Germans. The latter would be fortunate if their gunners were not driven from their guns, and if many of their pieces were not destroyed by direct hits. Far from being able to dominate the field and devote themselves to the task of supporting their own infantry, the massed batteries would be shortly, either reduced to impotence, or using their fire exclusively for their own protection.

A change of method has, therefore, been dictated by the changed conditions. The early deployment, the simultaneous advance, the simultaneous opening of fire, the massed batteries and the artillery duel as a separate act have dropped out, and in their place we have substituted a much closer association between the artillery and infantry from the very start of the action; and we have adopted the principle of economy of fire. The infantry, by advancing, must compel the enemy to disclose his position, while the artillery must be prepared to support the infantry with their fire at every stage of the action. We do not employ more guns than are necessary for our purpose, and if a greater volume of fire is required it is obtained by increasing the rate of fire, rather than by using more guns. We keep our fire power in hand.

The difference of method will be more clearly understood if we endeavour to follow the course of some incident of the battle as if it were being fought under the conditions of the present day. We will take again the attack of the 20th Brigade on the Galgenberg, as it will serve our purpose, and the reader who has followed the previous description of the infantry fire fight will be familiar with the ground over which the infantry must move.

We will assume, for the sake of convenience, that the operation is to be carried out by a British Division instead of a German Corps, and that the General Staff Officer of the Division has ordered the artillery of the Division to assemble in positions of readiness under cover of the Dieffenbach ridge, instead of ordering them into action. The General Officer Commanding the Division arrives on the ridge and decides to attempt to occupy the Galgenberg with the 20th Brigade for similar motives to those that have been attributed to Von Kirchbach.

The infantry will move in two columns via Woerth and Spachbach

as already suggested, the Woerth column taking as its objective the Northern end of the spur, and the Spachbach column taking the Southern end (*vide Map III and Panorama*).

The Divisional Commander will allot the task of supporting this attack to what he considers to be a sufficient force of artillery for the purpose. The infantry being numerically weak for their task, we will suppose that the General Officer Commanding decides to employ a strong force of artillery to support them, say 2 Q.F. Brigades and 1 battery of howitzers. Field Artillery Training lays down that the troops carrying out a distinct tactical task should be under one commander. The attack of the Galgenberg, in the conditions that we are assuming, is obviously a distinct tactical task, that is, distinct from the operations of the IInd Bavarians or of the advanced guard of the XIth Corps. We will assume, therefore, that the commander of the 20th Infantry Brigade (General A) is placed in command of all the troops taking part in the operation, and that an artillery officer (Colonel X) is told off to command the 2 Brigades of Q.F. artillery and the howitzer battery that are to co-operate. These troops now form a "temporary group" under General A with a definite task allotted to them, namely to gain a footing on the Galgenberg and drive the enemy back from that position on Elsasshausen. According to Field Artillery Training, it now becomes the duty of Colonel X to seek out General A and to find out from him the exact nature of the operation and the method of its execution.

Let us suppose that they meet on the Dieffenbach ridge, and that the following conversation takes place.

GENERAL A.—I am going to attack in two columns, one by Woerth and one by Spachbach. The Spachbach column will start first, as it has further to go, and has on the whole the more difficult task. It will move through the Fuchshubel wood and will endeavour to establish $\frac{1}{2}$ battalion and the machine gun sections of 2 battalions on the line of the Spachbach-Goersdorf road. As soon as they debouch from the Fuchshubel wood they will be exposed to artillery fire from the Froeschweiler ridge. They will get down the hill as quickly as they can, and I want you to support them. That will be your first task. What can you do?

COLONEL X.—I will do my best, but you will understand that, if the enemy's batteries remain completely concealed, I may be able to do very little. I will watch carefully for flashes or dust and do what I can to locate the enemy's guns or his observation posts. If an aeroplane reconnaissance could be made it might be of great assistance. I may add that if the enemy's batteries remain completely concealed, and your infantry move quickly, they probably won't suffer very heavily. If the guns come up to the crest I will give them a warm time.

GENERAL A.—Very well. Now the next task will be to support the advance of the Woerth column in a similar manner through the zone

swept by the enemy's artillery fire. They will deploy under cover of the Dieffenbach ridge on either side of the road and move straight on Woerth as rapidly as possible. When they reach Woerth they will get cover.

COLONEL X.—My previous remarks apply equally to this column. I will get into touch with the column so that I shall know when it is about to start.

GENERAL A.—When the Spachbach column reaches the village, the engineers must prepare some bridges. The enemy's artillery are sure to try and interfere, and long range rifle fire from the South-East corner of the Galgenberg may be nasty. Also, look out for the edge of the Niederwald. The situation there is rather uncertain.

COLONEL X.—I understand.

GENERAL A.—When the bridges are ready, the infantry will cross the river and try to rush across the meadows to the line of the railway. It is essential that you should know when this is about to take place. If you will arrange for communication with the Spachbach column, I will run a telephone to you from the Woerth column.

COLONEL X.—I can do that, and will send an officer forward with the Spachbach column to keep me fully informed.

GENERAL A.—I shall go with the Woerth column and establish a fire position on the Western outskirts of the village. As soon as I see that the Spachbach column has established itself on the line of the Hagenau high road, I shall endeavour to join hands with it and make a concerted advance up the hill. It is essential that my flanks should be protected, and I expect to suffer from fire from the edge of the Niederwald and from guns, and possibly machine guns, at the heads of the re-entrants. Please help me here if you can.

COLONEL X.—I will do everything I can. I may be able to locate the guns at the heads of the re-entrants by their flashes, as they will quite possibly be firing direct, but the machine guns will be a difficult matter.

GENERAL A.—I have not sufficient force to make my attack enveloping to any great extent, and it seems to me that the easiest line of approach will be against the Western slopes of the spur. There I shall be defiladed from the enemy's artillery fire, and I trust to you largely to keep the enemy back from the forward crest, so that I shall be able to advance up the hill for some distance in dead ground.

COLONEL X.—That will be my primary object when I see the infantry pressing forward up the hill.

GENERAL A.—If I am successful in gaining a footing on the hill, I think it more than likely that I shall come under a heavy artillery fire as soon as I reach the crest, and that I shall be counter-attacked. Now I want to ask you a question. Will you push guns forward during the attack, and will you be in a position to get any guns up on to the hill to help me when I get there ?

COLONEL X.—I do not think I can improve matters by pushing guns forward during the attack. The range from the crest of the Dieffenbach ridge is suitable, and the observation should be fairly easy. If I send the guns forward they will be exposed to the enemy's artillery fire for no adequate advantage. As regards getting guns forward to help you as soon as you gain a footing on the spur, I am afraid the Woerth road will be denied to me. It is fully exposed to the enemy's artillery fire, and I could hardly expect to get any number of guns down it. The only practicable route by which guns can reach the Galgenberg seems to me to be via Gunstett bridge and the Hagenau high road. It is a long detour, and of course could not be successfully undertaken till we have a secure hold on the Niederwald. On the whole, I suggest that I try and dribble a few guns forward through Woerth, a section at a time, as opportunity offers, and that I rely chiefly on flanking fire for supporting you against counter-attack. If my guns are well dispersed, the enemy will be forced on to a very narrow front if he is to escape from the effects of my fire.

GENERAL A.—I agree. Now where will you put your batteries?

COLONEL X.—I have already suggested a fairly wide dispersion of the guns for one reason, but it seems to me important for another, namely, to get the full value of cross fire on your main objective, the Galgenberg. I suggest that 1 Q.F. Brigade be North of the Woerth-Dieffenbach road, that 2 Q.F. batteries and the howitzer battery be between the road and Fuchshubel wood, and that 1 Q.F. battery be South of Fuchshubel wood. Of course, fire from Gunstett Hill would enfilade the enemy's position to a large extent, but I do not propose to send a battery there. Some batteries of the XIth Corps are already established there, and I suggest that a request be sent through the General Officer Commanding the Division to the XIth Corps, asking for some guns to co-operate with the attack on the Galgenberg from Gunstett Hill. I admit that you will have no control over them, and that from want of knowledge of what your object is they may conceivably do more harm than good at the critical moment. Still, I think the value of the cross fire is worth the risk. From the positions I have suggested I think I can carry out all the tasks you have referred to, but I will keep some guns in hand for unforeseen contingencies. That is to say, they will all be in action (under cover, to start with, at any rate), but I shall not necessarily use the fire of all the guns at first.

GENERAL A.—I agree with your proposals, but I am a bit afraid about those guns on Gunstett Hill, and I don't think I shall ask for support from that direction, at any rate at present.

After this conversation, which let us hope, between Officers inspired with the same ideas, would not take anything like so long in reality as it takes to read, the artillery commander goes off to reconnoitre for positions for his batteries. The reconnaissance of the actual positions

in this case should not present any considerable difficulty, and the artillery commander will be able to concentrate his attention on the communications between himself and his batteries, and between himself and the infantry. He must also choose his own position with care and with reference to that of his batteries. Having settled these preliminaries, he must allot tasks to his batteries, which will vary according to the progress made by the infantry. We will assume that the operation takes place as planned. The tasks will be as follows :—

1st Task.

1st Q.F. Brigade (North of road). Watch for enemy's guns in the zone North of Woerth-Froeschweiler road.

2nd Q.F. Brigade (South of road). Watch for enemy's guns in the zone between Woerth-Froeschweiler road and Elsasshausen.

Battery South of Fuchshubel. In observation ; no task allotted.

Howitzer Battery. Watch for enemy's guns South of Elsasshausen.

Woerth column reaches Woerth, and Spachbach column reaches line Spachbach-Woerth road, and engineers begin to make bridges.

2nd Task.

Zones for artillery targets as before.

Additional tasks.—2nd Q.F. Brigade keep down long range rifle fire from Galgenberg.

Battery South of Fuchshubel. Watch the Niederwald.

Information received from Spachbach column that the infantry are about to cross bridges and try and gain the line of the railway.

3rd Task.

1st Brigade and howitzer battery. As before.

2nd Brigade, 2 batteries North of Fuchshubel wood. Keep down infantry fire from the Galgenberg.

Battery South of Fuchshubel wood. Keep down infantry fire from Niederwald and the re-entrants of Galgenberg.

Infantry now debouching from Woerth, and moving forward on the left to the line of the Hagenau high road.

4th Task.

Artillery targets as before.

1st Q.F. Brigade. Protect flank of Woerth column from fire from the Froeschweiler re-entrant, and keep down fire of defenders of Northern portion of Galgenberg.

2nd Q.F. Brigade. As before.

Howitzers. Neutralize artillery and turn on to any trenches on Galgenberg.

Infantry nearing summit of Galgenberg and preparing to assault.

5th Task.

No change of tasks, but fire on Galgenberg increased in intensity.

Successful assault delivered, but attackers come under heavy artillery fire, and hostile infantry move forward from Elsasshausen to counter-attack. Attempt to get a section of guns through Woerth failed.

6th Task.

Artillery targets as before, but majority of guns turned on to counter-attack.

1st Q.F. Brigade. Counter-attack North of Elsasshausen-Woerth road.

2nd Q.F. Brigade. Counter-attack South of Elsasshausen-Woerth road.

Infantry give way before counter-attack.

7th Task.

All Brigades fire on Galgenberg to prevent enemy reaching crest to pursue infantry with fire, but care must be taken not to superimpose the fire of batteries so that they cannot distinguish their projectiles.

It has been assumed that the action took the form foreseen by General A., but nothing in war ever happens exactly as expected. While, therefore, it is always desirable to have a clear plan, to know exactly what you are trying to do, and to persevere to the utmost in the attempt to carry the plan through, it is very undesirable to make plans too far ahead, and it is essential to be prepared to meet unforeseen contingencies. This applies with force to artillery tactics. We do not commit our full strength till it is required—we unfold it, so to speak, as we go along.

We will now suppose that after this repulse the Divisional Commander decides to use the full strength of his Division in driving back the enemy's advanced troops, and attempting to gain the line Froeschweiler-Elsasshausen. The infantry Brigade, that has already been engaged, will not be in a condition to resume the offensive for some time, so the two remaining Brigades will deploy supported by the whole of the artillery of the Division. We will suppose that the Dieffenbach-Woerth-Froeschweiler road is the dividing line between the two Brigades. Including the battalions already engaged, there will thus be 8 battalions operating South of the road, and 4 North of it. Now Field Artillery Training says that when the whole of the troops of a Division are taking part in an operation under the direct control of the Divisional Commander, the system of "temporary grouping" of infantry and artillery that has just been described will not, as a rule, be resorted to. That is to say, the artillery will not come under the direct orders of the subordinate infantry commanders with whom they are co-operating, but will be under the orders of the C.R.A. of the Division. That is the case that we are now dealing with, and the mission of the 20th Infantry Brigade having

ended, owing to the failure of the attack, the "temporary group" originally formed should be broken up, and the artillery that had been placed under the General Officer Commanding 20th Infantry Brigade should revert to the control of the C.R.A. That Officer will now select positions for the whole of the artillery of the Division, and allot tasks to the several Brigades, in accordance with the instructions of the Divisional Commander.

Space does not permit of entering into further details, but the C.R.A. will probably allot to certain artillery Brigades the primary tasks of supporting the attacks on Froeschweiler and Elsassshausen respectively. Field Artillery Training makes it quite clear that in such a case the subordinate artillery commander must confer with the subordinate infantry commander with whom he is to co-operate in the manner that has already been described, even though he is not placed directly under his orders. Communication between the two arms will also be kept up throughout the operation, whether the system of "temporary grouping" is adopted or not. In this manner, the close co-operation of the artillery is assured, and, at the same time, the C.R.A. is in a position to allot secondary tasks to his Brigades, which allows him to make full use of cross and converging fire, when the circumstances are such that these can be used with effect.

We will now turn to the employment of the artillery of the XIth Corps. It is hardly necessary to point out that 72 guns could not be concentrated on Gunstett Hill under the conditions of the present day. Owing to the configuration of the ground it is most difficult to conceal artillery on this hill. Guns on the North of the hill are exposed to view from the Froeschweiler ridge, and guns to the South are exposed to view from the Morsbronn ridge. Moreover, the massing of the bulk of the artillery on this hill would sacrifice the very great advantage of a converging artillery fire in support of an enveloping attack. Everything, therefore, points to the desirability of a wide dispersion of the artillery on this flank, as far as and even beyond Durrenbach, if adequate escort can be provided. It is clear that the attack of the Morsbronn ridge is a distinct tactical operation, and that the troops taking part in it should be under one commander. They would not, therefore, be subdivided into "temporary groups," and the artillery would remain under the control of a single artillery commander. The desirability of this is clear if we consider the tasks which the artillery would be called upon to carry out. Supposing a "temporary group" were formed to operate, as did Von Schkopp's column, via Durrenbach on Morsbronn. The artillery of that group would support the attack on Morsbronn certainly, but if it confined itself to this task, the value of a converging and partially enfilade fire against the defenders of the Albrechtshausen and the slopes of the Morsbronn ridge would be sacrificed. The allotment of tasks by the C.R.A. so as to make full use of converging fire is, therefore, of paramount importance in this case.

As regards the defence, there are three main positions available for artillery—the head of the clearing, the Froeschweiler-Elsasshausen ridge, and the Morsbronn ridge. There is not much need or scope for artillery in the defence of the left flank. A Brigade suitably posted to flank the clearing and prevent the enemy debouching from the Langensultzbach wood is probably all that could be usefully employed. West of the Froeschweiler ridge there are suitable positions for concealed batteries which could be used to delay the advance of the hostile infantry down the slopes of the Dieffenbach ridge, and to engage the enemy's artillery. There are also excellent positions at the heads of the re-entrants from which to flank the spurs, prevent the enemy debouching from Woerth, building bridges over the Sauer, and crossing the meadows.

The Morsbronn ridge affords good concealed positions facing East from which to prevent the enemy debouching from Gunstett and crossing the river and meadows. But, when once the enemy's infantry reach the foot of the ridge, artillery co-operation with the defence becomes very difficult, owing to the command of Gunstett Hill, which allows the enemy a full view of any guns that are run forward to the crest. The artillery on this part of the position would nowadays probably compel the turning movement to move on a very wide arc, possibly even forcing the enemy to enter the Hagenau forest. As the turning movement developed, artillery on the Forstheim ridge would be invaluable, and this position would be essential for the support of any counter-attack delivered against the enemy's left flank before it gained access to the Niederwald.

EMPLOYMENT OF CAVALRY.

It is outside the scope of this paper to discuss the employment of the cavalry previous to the battle, so the remarks that follow will be limited to the events of the 6th August.

The Crown Prince's orders to the 4th Cavalry Division for the 6th August were to remain in bivouac at Shoenenburg, about 8 miles East of Woerth. The sound of the guns at Woerth was audible at Shoenenburg from an early hour, but Prince Albert of Prussia, who commanded the Division, considered it to be consistent with his duty to remain in bivouac and await orders. Instead of saddling up and getting the Division ready to move, while he reported personally to Army Headquarters for instructions, he remained with his troops and sent Orderly Officers to ask for orders. Unfortunately, the Headquarter Staff was so immersed in the events of the battle that the Cavalry Division was forgotten till a late hour in the evening, and the Orderly Officers "did not find an opportunity" to speak to anybody in authority. The result was the complete inaction of the Cavalry Division throughout the course of the battle, nor was the Division in a position to take part in the pursuit.

The question arises, what use should and could have been made of the Cavalry Division? Cavalry Training says that before a battle cavalry should be concentrated in positions of readiness. "In selecting these it is essential to study the configuration of the ground and its cavalry capacity, and to endeavour to foresee the nature of the fighting . . . whenever possible the bulk of the cavalry should usually be on that flank which offers the greatest freedom of movement." Such considerations point to the move of the 4th Cavalry Division at an early hour to Surburg, with a view to co-operation with the XIth Corps in the envelopment of the French right flank. The country between Morsbronn and the Hagenau forest was suitable for the action of cavalry, and the presence of a strong cavalry force in the neighbourhood of Gundershoffen during the afternoon might have had far-reaching results. Energetic action might well have led to the enemy being driven off his line of retreat on Saverne, and being compelled to fall back by Niederbronn on Bitche, or disperse in the Vosges mountains.

The inactivity of the Corps cavalry is more easily understood, as the actual battlefield was certainly unsuitable for cavalry action. But in the absence of the 4th Cavalry Division, it would still have been possible for a considerable force of cavalry to concentrate on the left flank in sufficient time to be most usefully employed, if thought had been given to the matter at Army Headquarters.

The feebleness of the pursuit is not, therefore, altogether accounted for by the absence of the Cavalry Division.

The French cavalry are not open to the charge of remaining ingloriously inactive, though their employment is open to criticism. The heroism with which they sacrificed themselves in order to cover the withdrawal of the infantry has been recounted, but could they not have been put to a more useful purpose without the necessity for such sacrifices?

Controversy has raged round this question of the employment of cavalry in battle during the past ten years in this country with much bitterness, but for a short time there appears to have been a truce, and the views of the General Staff, as embodied in Field Service Regulations and Cavalry Training, are now less frequently attacked. Those views are that the primary duty of cavalry in battle is to make use of the opportunities produced by the other arms, and that those opportunities will be likely to occur as the crisis of the battle is reached. Cavalry, therefore, should be suitably placed to take advantage of these opportunities, and the cavalry commander should take every possible step to inform himself of the progress of events, so that he may intervene with decisive effect when the opportunity offers.

If we endeavour to apply this doctrine to the French cavalry at the battle of Woerth by the light of the passage quoted above from

Cavalry Training, it appears reasonable to suggest that MacMahon should have concentrated the bulk of his cavalry West of the Forstheim ridge, with the object of co-operating on the outer flank of his General Reserve in a counterstroke against the flank of the XIth Corps. In this position the cavalry would have had freedom of movement, and could have gained access to ground suitable to their action. The resistance offered by Lartigue's Division, coupled with the counter-attack of the General Reserve, would, in all probability, have produced an opportunity for the employment of a considerable cavalry force with decisive results. In the opinion of the General Staff these results can still be obtained in favourable circumstances by shock action.

It will be remembered that the employment of the German 4th Cavalry Division on the same flank has been recommended. At first sight, it may appear that in such a case the two cavalry forces would either neutralize one another with dismounted action, or engage in a cavalry encounter such as took place on the 16th August, 1870, near Ville sur Yron. It must be admitted that such results are not unlikely, but cavalry encounters wide on the flank of a battle should not be sought after for their own sake, and the action of the cavalry should be reserved for those opportunities that are likely to produce the most decisive results.

The cavalry of the defence has an important function to perform in these days in hampering and delaying the turning movement with dismounted fire. A regiment or two of cavalry in the valley of the Eberbach, trained as our cavalry now are in the use of the rifle, and supported by artillery from the Forstheim ridge, would have made things very unpleasant for Von Schkopp in the absence of any strong force of cavalry supporting the turning movement.

It is impossible to leave the subject of cavalry without a further reference to the charge of Michel's unfortunate Cuirassiers, which has so often been quoted by the opponents of shock action in support of their arguments. When considering the value of such arguments based on this incident, we must remember the facts. No previous reconnaissance, a commander taken by surprise and not aware of the situation that he was called upon to deal with, haste and consequent confusion, a very unsuitable terrain, the worst possible direction chosen, and, finally, a village taken as an objective. Many excellent authorities think that if Michel had been better informed as to the situation and the ground, had moved down the valley of the Eberbach under cover and, forming to the left, had charged Von Schkopp's infantry in flank instead of in front, he might have achieved great results. No doubt by these means surprise might have been achieved, and, when that is the case, all things are possible. Even the most sceptical will probably admit that if the French cavalry commander had been imbued with the spirit of our present

Regulations, and had acted up to them, he might have used his nine squadrons with far greater effect and less loss.

STRENGTHENING SUPPORTING POINTS AND ENTRENCHING IN THE ATTACK.

The Germans in 1870 were, as a rule, careful to strengthen supporting points in rear of attacking troops, a very wise and a very necessary precaution. We know that they put Woerth in a state of defence, which assisted them in repelling many counter-attacks. We are told that at one time they set a battalion to work to strengthen a position on the Dieffenbach ridge. Probably these were not the only occasions on which they applied this important principle.

Such tactical points as Langensultzbach, the Oil Mill, the Saw Mill, Woerth, the line of the Hagenau high road, Spachbach, the Bruchmill, and Gunstett, should be occupied by reserve troops, and placed in a state of defence as soon as the position of the firing lines affords adequate protection to the working parties.

We do not, however, read of any entrenching taking place in the firing lines during the actual progress of the attack. To some extent this appears to be a comparatively new idea, based on the methods adopted by the Japanese in Manchuria, though we know that Skobeleff's troops, after their experiences before Plevna, carried their heavy entrenching tools on their backs to within a few miles of Constantinople, rather than be parted from them.

When considering this question of entrenching in the attack, let us liken a battle for a moment to a boxing match. Some battles, like some boxing matches, are fought quickly, while others are fought slowly. The national characteristics of some troops, and the way that others are trained, tend to make them quick fighters, and to make others slow fighters. It would probably be right to say that the French would always be quick fighters. They certainly were at Woerth, and exhausted themselves rapidly in consequence. The Russians on the other hand would probably always be slow fighters.

These characteristics would naturally re-act on their opponents. Against such opponents as the French proved themselves to be at Woerth the Germans were obliged to force the pace in order to make their numerical superiority tell. The Japanese against a less active enemy could adopt more leisurely methods.

One has only to ask the question: Where would the XIth Corps have been at 4 p.m. if the firing lines had stopped to entrench every vantage point gained? to realize that such methods are not suited to the task which fell to the lot of this Corps. Too much spade work in the XIth Corps would not only have let off Lartigue's Division, but would have allowed MacMahon time to alter his dispositions and arrange an effective counterstroke. The battle could not have been won before dark.

While admitting then that the "attack with the shovel" may be a necessity under modern conditions in frontal attacks against strongly defended localities, it seems to be very desirable to remember that occasions will arise when time is of the utmost importance, and consequently, the adoption of such methods entirely out of place. The necessity to force the pace of the decisive attack will be as imperative as ever.

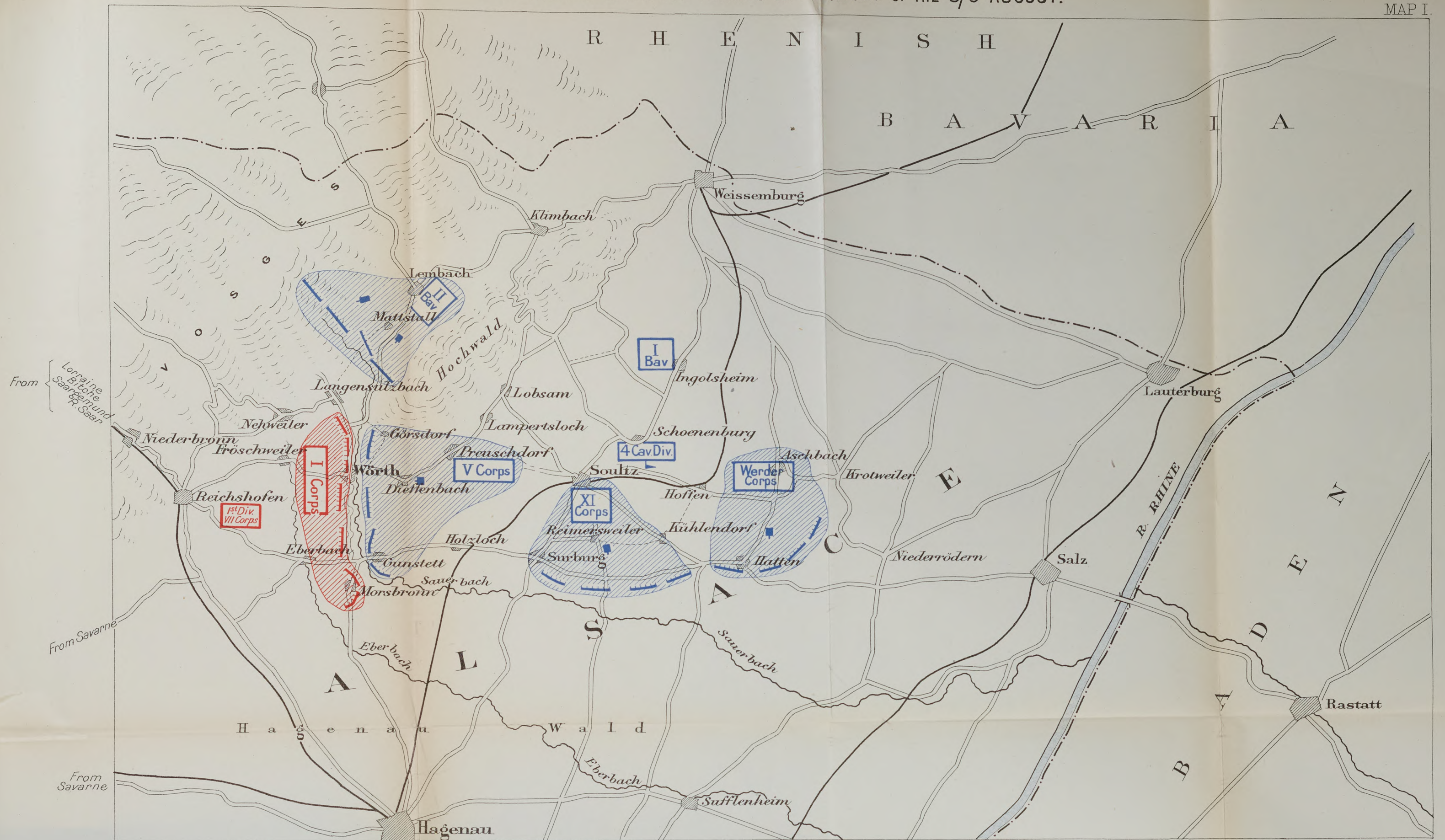
CONCLUSION.

This concludes the analysis of the battle of Woerth, which, as stated in the introduction to this article, has been undertaken with the object of showing the abiding value of some of the tactical lessons of history, and also the necessity to modify tactical methods as armaments improve from time to time.

It is the writer's hope that the method of analysis of the various incidents that has been adopted may be of some small assistance to officers who are compelled to study tactics from history without the aid of an instructor, and that they may be able to apply it with profit on their own account in other cases.

SITUATION OF OPPOSING ARMIES ON THE NIGHT OF THE 5/6 AUGUST.

MAP I.



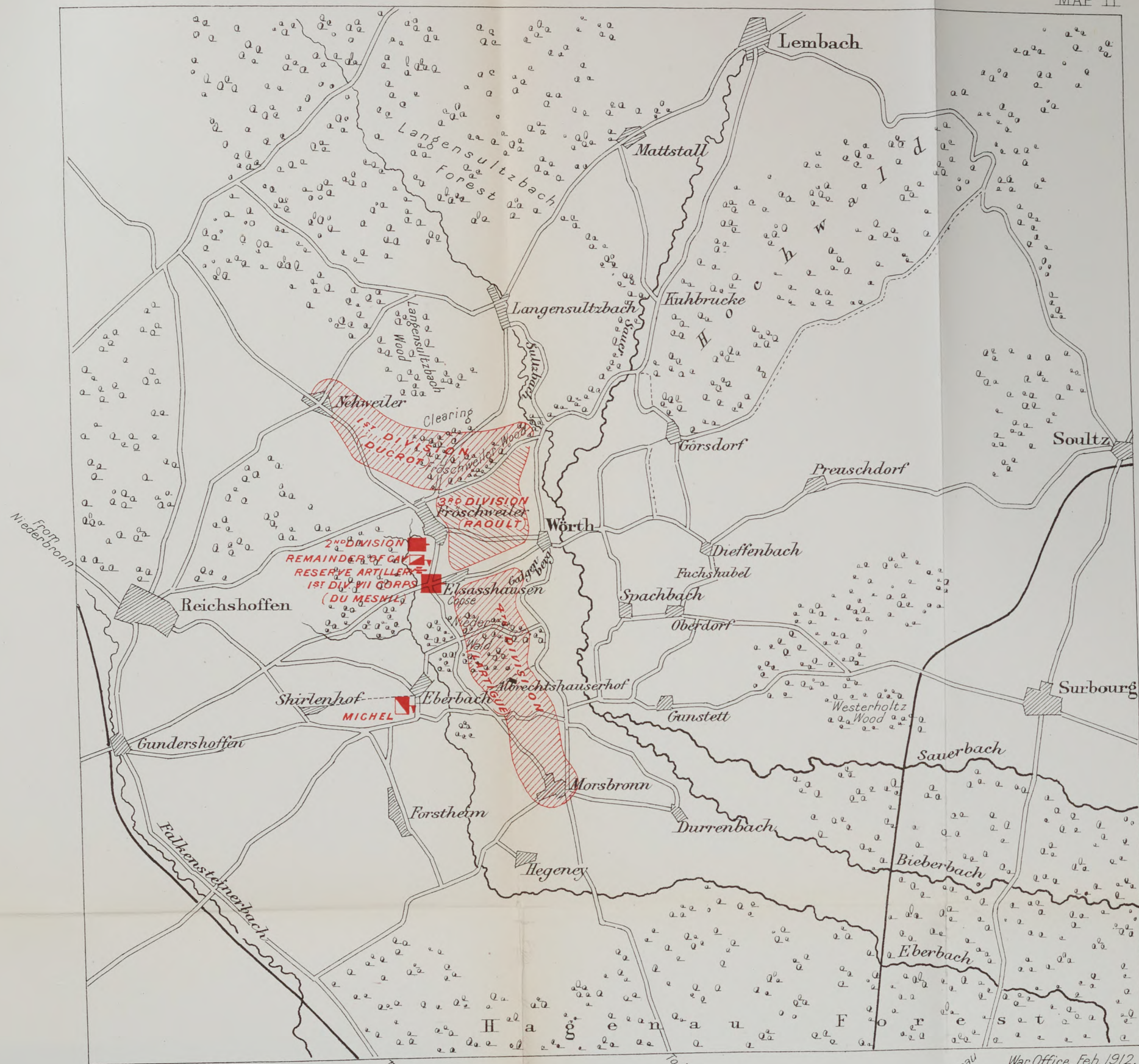
Scale 1:26720 or 1 Inch to 2 Miles
MILES 2 4 6 8 10 MILES

War Office, Feb. 1912.

10
9
8
7
6
5
4
3
2
1

DISPOSITION OF THE FRENCH TROOPS 8.15 A.M. 6TH AUGUST 1870.

MAP II



To Hagenu To Hagenu
Scale 63360 or 1 inch to 1 Mile
MILE 1 2 3 4 MILES

War Office, Feb. 1912.

BATTLE OF WÖRTH

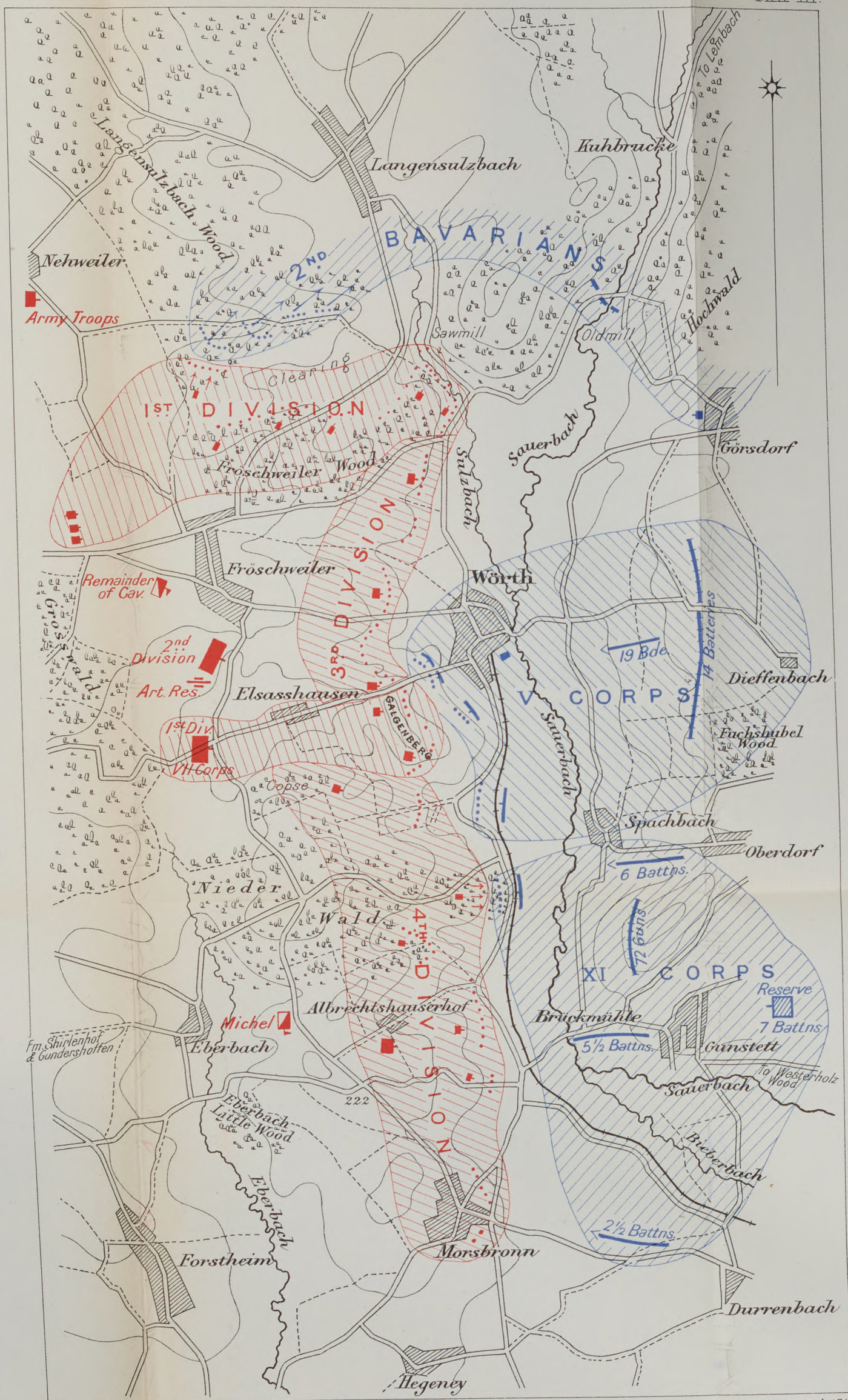
SITUATION AT 11a.m.

6TH AUGUST 1870

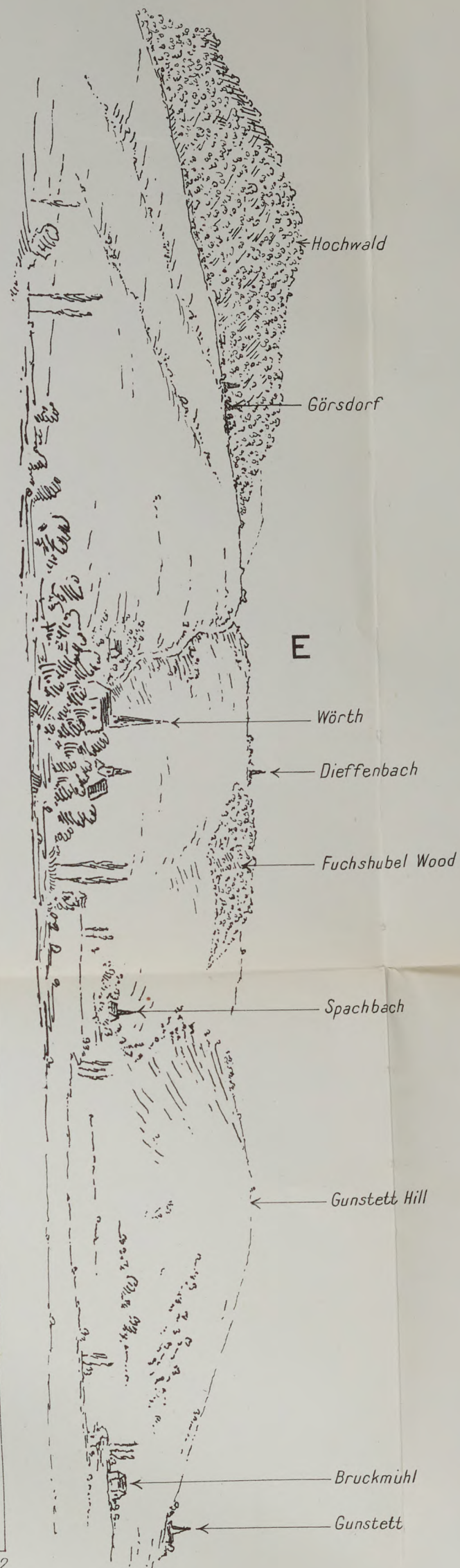
MAP III.

View looking West
towards the French.

View looking East
towards the Germans.



War Office, Feb. 1912.



APPENDIX I.

RECENT PUBLICATIONS OF MILITARY INTEREST.

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Reviews of Books—	
Artillery.	614
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Fortification and Military Engineering.	616
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REVIEWS OF BOOKS.

ARTILLERY.

Artillery in Battle (*L'artillerie au Combat*). By General Percin. 88 pp. 8vo. Paris, 1912. Lavauzelle. 2s.

This book is devoted to a criticism of that part of the French Provisional Field Artillery Regulations which deals with the employment of the artillery in war. In it the author discusses several matters which have been included in our own new Field Artillery Training Manual for the first time.

In the preface, General Percin admits that a considerable advance is shown in the new French Regulations, but is of opinion that, owing to the undue proportion of artillery officers appointed to serve on the committee which drew them up, insufficient regard has been paid to tactical requirements. In the first chapter General Percin sets out to show the errors which have arisen (1) from making the characteristics of the equipment the basis of its tactics, and (2) from subordinating the choice of positions and the moments for their occupation to considerations of a technical nature, instead of to the tactical object. Finally, in this chapter he points out that the result of the anxiety to make use of the characteristics of the gun is that the Regulations encourage a defensive attitude.

Thus, the three leading principles of the employment of the artillery, quoted below, are deduced from the characteristics of the equipment:

1. The artillery will occupy concealed positions for choice.
2. Priority in the occupation of positions should be sought for energetically.
3. It should be the aim to make use of oblique fire.

As regards the first of these, General Percin maintains that the choice of concealment does not rest with the artillery, but depends on the task assigned to it. He would substitute the following principle: "The Artillery will adopt the maximum concealment compatible with its task."

With regard to the second principle, General Percin contends that it leads inevitably to defensive action, and he believes the error to be due to an unwillingness to regard the task given to the artillery as the dominating factor in its employment. In other words, only those batteries for which there is immediate use should be deployed, while the remainder should occupy convenient positions in readiness. This contention he supports by statistics, carefully collected at manoeuvres

to show that where batteries have been deployed in anticipation they have found it impossible to fulfil the task allotted them.

In our own Field Artillery Training this question is discussed under the heading of "Economy of Force" (Sec. 146), which teaches that only such force should be employed as is necessary for the immediate tactical object, in order that as large a reserve may be kept in hand for future developments.

As regards the last of the above principles, no better statement of its relative value can be made than the following sentence which we take from General Percin's book: "Before all else, the artillery must be placed so as to give efficient support to its own infantry. To fulfil this task the first condition is the possibility of intercommunication. It is better to kill 10 men at the right time and place, than 50 whose disappearance will not assist the progress of the attack. Between two positions both of which are good for intercommunications, that one should be chosen which lends itself best to oblique fire; but the first condition of success must not be sacrificed to the second."

The second chapter is devoted to a discussion and criticism of the paragraphs dealing with the subject of intercommunication. The conclusion to which General Percin comes, is that for sentimental reasons the majority of the committee were unwilling to give full effect to a ministerial circular which laid down that the troops of all arms, temporarily employed on a single tactical task, must, on the field of battle be under the orders of one man. The impression he gathers is that the artillery is anxious to perpetuate the idea that some mysterious power is essential to anyone who would give it orders.

Briefly, the chief objections offered to such subordination as the circular indicates and his comments thereon are as follows:—

1. If part of the artillery is given to a subordinate commander by Headquarters, it will be very difficult to regain control of it.
2. This infantry commander is insufficiently acquainted with the methods of allotting batteries to objectives.
3. If artillery is handed over to a subordinate commander, the latter is liable to use it for some other task.

As regards the first, General Percin says, the fact that the divisional artillery and two brigades of infantry are under the orders of the divisional general has never prevented the corps commander taking some of his guns and infantry.

As regards the second, even if this science, which does not really require very great knowledge, is lacking in the case of the infantry commander, the subordinate artillery commander is there at hand. And it is much better for those on the spot to modify the distribution of guns to objectives than await the approval of the divisional artillery commander who is probably far away.

The third objection is sufficiently answered so far as regards the artillery by saying that it is no concern of theirs, but is a matter for the divisional commander, who would presumably take care that it never happened a second time.

While General Percin is firmly of opinion that to carry out a tactical task all the troops must be obedient to one will, he still believes in the possibility and necessity of maintaining the artillery chain of command, in order that the superior artillery commander may keep in touch with the state of affairs in the various artillery groups.

The last chapter deals with the form of the regulations, which are not sufficiently convincing in General Percin's opinion. He considers, too, that the responsibilities of the various commanders with respect to the artillery should be more clearly defined.

As has already been pointed out, regulations dealing with several of the questions here discussed have been included for the first time in the new Field Artillery Training, and it will well repay anyone interested in artillery matters to compare the sections in that book which deal with employment in war with what General Percin has to say on the same subjects.

BOOKS OF REFERENCE.

Military Reference Book. Памятная Книжка, 1912. 880 pp. 12mo. Military Press, St. Petersburg, 1912. 6s.

A useful work of reference, published annually, giving the names of persons holding office in the Army, Navy, Court, and in the various Civil Departments of the Government. It also contains the dress regulations for officers and the rules for wearing medals and decorations, both Russian and Foreign.

FORTIFICATION AND MILITARY ENGINEERING.

Battery siege-works. Батерейные Работы. Official manual. 67 pp. with numerous plates. 8vo. St. Petersburg, 1908. 3s. 6d.

This book is one of the special manuals for the training of Russian engineer troops, and it describes the various types of field works and platforms used for siege and fortress guns. The time-worn method of laying out these works by night is still employed; a simple form of rope framework is utilized to mark out rapidly the dimensions of gun platforms on the ground. One non-commissioned officer and four sappers constitute the engineer party allotted to supervise the infantry working party numbering from 75 to 90 men for each gun. It is laid down that 5 to 10 minutes' rest shall be allowed after every period of 20 minutes' work. A special chapter is devoted to the siting of batteries.

Russian Regulation of the 13th November, 1910, on Field Fortification for Officers of all Arms. (Règlement Russe du 13 Novembre, 1910, sur la fortification de campagne pour les officiers de toutes les armes.) Translated from the Russian by Chef de Bataillon Painvin. 91 pages with 61 plates. 8vo. Paris, 1911. Lavauzelle. 3s. 6d.

This work is a very full précis of the Russian official manual, "Instruction in Military Engineering for Officers of all Arms, 1910,"

which was reviewed in *THE ARMY REVIEW*, Vol. I, pp. 423-424. The plates are reproduced from the original Russian manual, but the dimensions on them have been converted to the metric system.

HISTORY.

Mobilization of the French Army in 1870-71. (*La Mobilisation de l'Armée: Mouvements des Dépôts.*) By A. Martinien. 460 pp. 8vo. Paris, 1911. L. Fournier. 8s.

This book, which is published by the authority of the Historical Section of the French Army Staff, should be interesting to students of the Franco-German war. It gives the mobilized strength of every unit of the active army, shows the strength of every dépôt at certain dates, explains the various formations and detachments which the dépôts raised during the war and where these detachments were sent. Based as it is on official reports and the archives of the French War Office, this book must be regarded as a trustworthy authority on the strength of the French army from July, 1870, to March, 1871, and is therefore indispensable to any future historian of the war.

The Letters and Journal of Count Charles Leiningen-Westerburg. Edited with an introduction by Henry Marczali, Ph. D. Professor of History in the University of Buda-Pesth. 330 pp. 1 map, 2 photographs. 8vo. London, 1911. Duckworth & Co. 3s. 9d.

Count Charles Leiningen-Westerburg, a member of the princely house of Leiningen, held, at the outbreak of the war of Hungarian Independence, 1848-49, a commission as Lieutenant in the Austrian Army. Married to a Hungarian lady, he threw in his lot with the Hungarian cause, and fought his way up to the rank of General, until his military career was closed by the final capitulation of the Hungarian army to the Russians at Vilagos. He was tried by Court Martial, composed of officers of the Austrian Army, and on October 6th, 1849, a day still observed in Hungary as one of public mourning, he, with twelve other Hungarian Generals suffered death at the hands of the executioner.

His letters and journals show him to have been a man of noble and chivalrous character, and, to employ an expression which he regarded as the highest form of eulogy, a "good soldier."

The book under review would, no doubt, afford interesting material to a historian. From a military point of view it is of little value.

Professor Marczali, in his introduction, makes no attempt to bring out the salient points of military interest in the period of which he treats. The journals and letters themselves, written during the stress of a campaign, are disconnected and abrupt, and do not enable the reader to follow the thread of the military operations.

Diplomatic Documents relating to the Origin of the War of 1870-1871. Vol. IV. (*Les origines diplomatiques de la guerre de 1870-1871.*)

Tome IV.) Published by the French Foreign Office. 403 pp. 9 ins. by 6 ins. Paris, 1911. Gustave Ficker. 6s.

This volume contains rather more than a thousand official documents, chiefly despatches, arranged in four groups corresponding to the months of August, September, October, and the first five days in November. The documents are not connected by any narrative, but explanatory comments and cross-references are freely given in the footnotes. The portion of the book allotted to each month is preceded by a diary of events. Some short biographical notes on the French diplomatic agents, and a list of ministers and ambassadors of foreign states are given in an Appendix at the end.

To those who are tolerably familiar with the course of events in Central Europe during the momentous years 1864-1871, a perusal of these despatches presents all the interest of the opening stages of a drama. It will be remembered that in August, 1864, Denmark, abandoned by all the Powers to whom she had looked for support, and realizing the futility of further resistance, had agreed to an armistice as a preliminary to negotiations for peace. The point which emerges most strikingly from the August series of despatches is the despair of the Danes on learning the severity of the terms imposed by the victors; compelled to face the loss of the Duchies, their hopes are now centred on retaining possession of the northern Danish-speaking districts of Schleswig. Napoleon is sympathetic and expresses to Prussia (No. 797) his strong disapproval of any arrangement which should disregard racial boundaries; Austria appears inclined to moderation, though the French Ambassador observes (No. 802) that he dreads the effect of the "military enthusiasm" of the generals accompanying the King of Prussia during his visit to Vienna. This "military enthusiasm" of a victorious army is a factor of which we obtain glimpses more than once, influencing Bismarck to resist any abatement of his demands.

Russia sympathises with the Danes, but has been too much alienated from France by the Polish question to consider any joint action with Napoleon. "The time will come," observes a Russian naval officer (No. 817) as he surveys the German fleet established in the newly acquired harbour of Kiel, "when we shall bite our nails with vexation at having allowed Bismarck to crush the Danes and appropriate their best harbour." One of the most interesting despatches in this section (No. 821) relates a conversation between the Bavarian Minister, Baron von Schronk, and Bismarck, which is prophetic of the latter's policy towards the smaller German States.

In the next portion of the book (1st to 30th September, 1864), Italy appears on the scene; negotiations are proceeding for the withdrawal of the French troops from Rome, and a convention to this effect is concluded (15th September) in spite of the remonstrances of the Pope, whose objections to the convention are summed up in a conversation between the French Ambassador and Cardinal Antonelli (No. 870).

Bismarck's attitude towards the smaller German States grows more friendly during this month and he appears to be anxious lest they should be driven into the arms of Austria; the fate of the Duchies must now, he says, be decided by the Diet; Prussia will be content with Lauenburg, though he admits, in a burst of confidence, that this will be only *to begin with*. "Time will do the rest, for the mission of Prussia is to expand."

A despatch from the French minister at Frankfort reproduces, at second hand, Bismarck's suggestion of an understanding between Prussia, Russia, and France, by which Prussia was to get the minor German States, Russia the Danubian Principalities, Italy Venetia, and France the left bank of the Rhine including Belgium—a bait which Bismarck was never tired of dangling before Napoleon's eyes. The desire of the King of Prussia to meet Napoleon is expressed in more than one despatch though it is indicated that this was only a move in the game which Bismarck was playing against Austria. Meanwhile the despatches from Kiel grow more and more pessimistic; the Prussians, writes Meroux de Valois, will take Schleswig and Jutland also in the end; the Prussian officers are, he observes, indignant at the talk of concessions and demand annexation.

The October despatches are chiefly concerned with Italy; Austria is dissatisfied with the Franco-Italian convention, and asks pertinently how France can make Italy keep her undertakings concerning the integrity of the Papal States. The Italians do not conceal that they regard the transfer of the capital from Turin to Florence as merely a stage towards Rome.

It becomes evident that Austria's absorption in this new question is unfavourable to the hopes of the Danes, since it makes her eager to have the Schleswig-Holstein question finally settled; simultaneously the attitude of Bismarck becomes less conciliatory towards Denmark.

An interesting document in this series (No. 940) contains extracts from General Bourbaki's report on the Prussian manoeuvres in September. The organization of the Prussians is, in this general's opinion, much inferior to that of his own army; officers are hard working and patriotic, but lacking in intelligence and experience; the Prussian artillery is inferior to the French both in personnel and matériel; the administrative services are either unorganized or non-existent; the only points of superiority which he will concede to the Prussians are the armament of their infantry and the riding of their cavalry officers!

The month of October closes with the interview between Napoleon and Alexander II. at Nice, and the signature (30th October) of the Treaty of Vienna between Denmark, Prussia, and Austria; by this treaty, the full text of which is given in the Appendix, Denmark renounces all rights over the Duchies of Schleswig, Holstein, and Lauenburg, in favour of Prussia and Austria, and agrees to recognize whatever dispositions these Powers should make for the future government of the ceded territory.

The last series of despatches covering the period 1st to 5th November,

1864, deal principally with questions arising out of the Franco-Italian convention of September.

The Battle of Austerlitz, for the use of Visitors to the Battlefield. (Die Schlacht bei Austerlitz. Behelf zur Begehung des Schlachtfeldes.) By Lieutenant-Colonel von Vedropolje, General Staff, Austro-Hungarian Army. 60 pp., 3 sketches. 8vo. Vienna, 1912. Seidel. 2s. 1d.

The author gives a succinct summary of the events which immediately led up to the battle. A very clear précis of the events and phases of the battle on December 2nd is then given, and the distribution and the *ordre de bataille* of each army is shown in tabular form. A few explanatory comments are made, but, generally speaking, the author does not go beyond the immediate purpose of his book, and contents himself with summarizing clearly what actually happened. The book, accompanied by three sketches, is of a portable and handy form, and should be of value to visitors to the battlefield who understand German.

Battles and Combats in the Southern Tyrol from 1701 to 1866, with some reflections on Mountain Warfare. (Die Kämpfe in Südtirol von 1701 bis 1866 mit Betrachtungen über die Kriegführung und Kampfweise im Gebirge.) By Major-General Freiherr von Lutgendorf, Austro-Hungarian Army. 206 pp., 33 sketches. 8vo. Vienna, 1911. Seidel. 4s. 6d.

The operations which took place in the Tyrol, in the course of the following campaigns, are summarized and commented on:

- (a) 1701-3. War of the Spanish succession. Operations under Prince Eugene, Catinat, Vendome, and Siege of Trent.
- (b) 1796, 1797. Operations under Napoleon, Beaulieu, Wurmser, Davidovitch, Alvinzi, and Archduke Charles.
- (c) 1800. Operations under Bellegarde, Brune, Macdonald, Moncey, and Vukassovitch.
- (d) 1809. The rebellion in Tyrol. Operations under Chasteler and Andreas Hofer.
- (e) 1848. Operations against Italian guerilla bands.
- (f) 1859. " " " "
- (g) 1866. Operations under Garibaldi, and defence of the Tyrol by Kuhn.

The matter is well arranged and copiously illustrated with excellent sketches. The account of each campaign is followed by a criticism and commentary, which points out the lessons to be learnt and the principles exemplified. In a final summary at the end of the book the general lessons to be gathered from the campaigns examined are collected under suitable headings, and the necessity of a good communication service is emphasized.

The War. By J. H. Wood. 181 pp., with illustrations. 8vo. Cumberland, Maryland, 1911. The Eddy Press. 4s. 2d.

This book contains a brief account of personal adventures and of the operations of the 37th Virginia Infantry Regiment of the

"Stonewall" Brigade during the American Civil War. In this unit the author served as Captain of "D" Company, until captured in the well-known disaster of the Brigade at "Bloody Angle," Spottsylvania Court House, in May, 1864.

At the commencement of the war Captain Wood was a Cadet at the Virginia Military Institute and, like the other students, he was sent to Richmond to instruct recruits. As he says, the "V.M.I. now disclosed its inestimable worth."

He gives verbatim the first speech that he heard "Stonewall" Jackson make, whilst he was still a Professor at the Institute, in March, 1861. It was simply this:—"Military men make short speeches, and as for myself I am no hand at speaking anyhow. The time for war has not yet come, but it will come and that soon, and when it does come my advice is to draw the sword and throw away the scabbard." He confirms the story that Jackson was nearly captured at Port Republic and only escaped by a ruse. He saw the enemy's troops in possession of the bridge over the Shenandoah, assisted in driving them off and "when within a hundred yards of it met Jackson riding rapidly from the direction of the bridge."

According to Captain Wood's account it would appear that the Confederate disaster at "Bloody Angle," Spottsylvania Court House, was caused, as at Nicholson's Nek, by some unauthorized person hoisting a white flag.

Itinerary of Napoleon I. (*Itinéraire Général de Napoléon I.*) By Alfred Schuermans. 464 pp. 8vo. Paris, 1911. Jouve et Cie. 6s.

This itinerary is a record of the movements of the first Napoleon throughout his entire life. The idea of writing such a work did not originate with M. Schuerman; other books purporting to fulfil the same object have appeared at various times during the last century; such were the "*Itinéraire Général de Napoléon*" by Perrot (1845), and the "*Tableau Chronologique de l'Histoire de Napoléon*" (1854), but all these works were, as M. M. Houssaye points out in the preface, not only incomplete, but full of obvious inaccuracies, while in no case were their statements supported by references to authoritative sources. M. Schuerman's work leaves nothing to be desired in any of these respects. It contains no gaps of importance from the day of Bonaparte's entry, as a boy of ten, at the military school of Brienne, till the record closes with the words "*Napoléon est mort*" in May, 1821, while the numerous references given in the footnotes show that no pains have been spared to obtain information from the most trustworthy sources.

The author has wisely avoided being drawn into narrating the history of the scenes through which the itinerary leads him. The events of each day are recorded as a rule in a few laconic sentences; on the other hand he has not hesitated to add explanatory notes where the occasion seems to require it, nor has he been prevented by the terseness of the style which he has adopted from introducing some expressive touches

which raise the book above the level of a mere calendar, and bring vividly before the readers the most striking traits of Napoleon's character: his bold decision, his indomitable self-reliance, and, above all, his untiring activity.

The Franco-Russian War of 1812. Vol. VII. (*La Guerre Nationale de 1812.*) Published by the Scientific Committee of the Russian General Staff, and translated into French by Captain Cazalas under the direction of the Historical Section of the French General Staff. 415 pp., with an index. 8vo. Paris, 1911. Lavauzelle. 16s. 8d.

This volume, which is the seventh of the series, deals with the preparations for the war of 1812. The book is divided into three parts: the first containing correspondence between Russian Ministers or representatives and the Minister of War in December, 1911; the second consisting of miscellaneous and undated documents which have been omitted from previous volumes; and the third being the correspondence of General Barclay de Tolly himself. The documents in each part are numbered consecutively, and are unconnected by any narrative; they have, however, been classified in the preface under thirteen headings, viz., reconnaissances of the western frontier and its defences, foreign fortresses, maps, supplies, intelligence from foreign countries, intelligence from Bielstock and Poland, secret agents, strangers entering Russia, plans for operations, internal administration, and inventions.

This classification and the addition of an index in three parts—(1) personal; (2) army units; (3) geographical—greatly facilitate reference.

The despatches in the first part are full of warnings of the inconvenience of war, and contain information which must have been of the utmost value to the Russian Intelligence Department. In this respect the most interesting are those of Colonel Tchernychev, an Aide-de-Camp to the Emperor who was stationed at Paris. In his despatch No. 18 we are afforded an insight into his methods. He has obtained, by means of paid agents in the French War Ministry, the march tables of the troops who are concentrating in Germany towards the Russian frontier, as well as the quarterly distribution states of all the French troops throughout the Empire. The disappearance of these pamphlets and their re-appearance in Russia has come to the ears of the vigilant Minister of Police; Napoleon utters threats of vengeance, the guilty officials are trembling in their shoes, and the watch kept on Tchernychev is redoubled; nevertheless he continues at his work, and his despatch of the 31st December, in which he asks to be relieved, contains information no less detailed than his preceding ones. Important intelligence was also supplied by Count Lieven at Berlin; his report of the 16th December that six months' supplies for 30,000 men were being assembled at Danzig should have left the Russian War Minister in little doubt as to the inconvenience of invasion. The movements of the Austrian troops towards Galicia and the probable attitude of Austria in case of a war between Russia and France are the subject of several despatches

from Baron Tuyll at Vienna. One of these contains an interesting appendix in the form of some intercepted correspondence from the theatre of war in Spain, illustrating the extent to which Napoleon was hampered by Massena's failure to expel the English. The papers contain, among other matters, the form of proclamation in which Joseph was to announce his abdication, as a preliminary to the incorporation of Spain in the Empire, together with the reply which was to be made by the Council of State, and Napoleon's address to the Spanish people on taking over their country.

Among the miscellaneous and undated documents special interest attaches to a report (No. 11) on the military situation in the Duchy of Warsaw; to a letter from General Barclay de Tolly (No. 15) on the military geography of the probable theatre of war, followed by an "appreciation of the situation" (No. 16) by the same writer, for the perusal of the Emperor; and to a very full Memorandum on the defence of the Russian Empire (No. 20). The third part of the book contains some curious letters referring to secret agents, and deserters crossing the Russian frontier.

Students of history will be grateful to Captain Cazalas and the French Historical Section for placing the sources of so much valuable information within their reach.

Through Armenia and Xenophon's March. (Durch Armenien und der Zug Xenophons.) By Lieutenant-General E. v Hoffmeister. 242 pp., maps, sketches, and illustrations. 4to. Leipzig and Berlin, 1911. B. G. Teubner. 8s.

The author of this extremely well got-up book has recently travelled a good deal in near and middle Eastern localities, the present work being, as regards Turkey in Asia, more or less a companion volume to "Cairo-Baghdad-Constantinople," which appeared in 1910.

The book is divided into two parts; the first deals with Armenia, as it is at the present day, and the second describes Xenophon's march in olden times through a part of the same locality.

General Hoffmeister started on his journey from the Russian end of Armenia and travelled by Kars across the Turkish frontier to Erzerum and the Black Sea. It will be noticed that he employs the designation "Armenia," though this is no recognized administrative nor geographical division of country as far as Turkey is concerned; the late Sultan refused to admit any Armenian nationality, and Kurdistan is still the official nomenclature. However, to a military reader, the main interest in this portion of the book centres round the chapters dealing with the operations at Kars in 1877-78 and the aspect of the frontier zone altered in Russia's favour after that war. The possession now by the Russians of the exits from the Soghanli Dag and other important strategical points are discussed and commented upon, this question attaining an added importance at the present juncture by reason of the collision of Turkish and Russian interests in the adjoining zone of the Persian frontier.

The second part of the book, describing Xenophon's march in the beginning of the fourth century B.C., is called a military geographical study. The subject is dealt with in three portions : (a) the preliminary movement in March, 401 B.C., from Sardis (in Asia Minor near the present Smyrna) to Issus (on the Gulf of Alexandretta, near where at the present day, the branch from the Baghdad line is being led from Osmanie to Alexandretta); (b) the advance from Issus to Babylon viâ the left bank of the Euphrates up to the battle of Kanaxa, September, 401 B.C.; (c) the retreat from Babylon across the Kurdish highlands to the Black Sea west of Trebizond (February, 400 B.C.).

The Campaign of 1908-1909 in the Shawia (Campagne de 1908-1909 en Chaouia). General d'Amade's report, published by the Historical Section of the French General Staff. 395 pp., with 33 maps and 20 photogravures. Paris, 1911. Chapelot. 6s. 8d.

The events narrated in this report belong to the period commencing with the disembarkation of the French expedition at Casablanca in January, 1908, and terminating with General d'Amade's return to France in February, 1910.

The book is divided into three parts. Part I. narrates the operations of the flying columns against the Shawia tribes up to the expedition to Azemmur in June, 1908. General d'Amade's policy, which was carried out in the main with success, was to disintegrate the organization of the tribesmen by a series of rapid blows, and then, having asserted the superiority of the French arms, to proceed with the pacification of the country by means of a system of posts established at the principal centres. Students of the tactics of small wars will observe with interest the manner in which General d'Amade gradually modified his tactics to meet the special conditions of the country and the nature of the enemy. For instance, in the earlier actions, the French, relying on their Algerian experience, manoeuvred, as a rule, in square formation. The unsuitability of these tactics for Moroccan warfare was brought out in the action at Dar-Kseibat in January, 1908 (p. 55), where the losses of the column during a temporary retirement and its inability later in the day to complete the victory by a rapid offensive are to be attributed chiefly to the disadvantages of the square formations. In his comments on the combat at Sidi-Djebli in the following month, General d'Amade concludes that the greatest prospects for success lie in a rapid offensive by several columns converging on the enemy's position; it is essential, he writes, that the column attacking the front should progress rapidly; the task of the flank columns—a somewhat laborious and thankless one—is to prevent the enemy from enveloping the flanks of the frontal attack; he then goes on to indicate that a disposition of infantry and cavalry in échelon, flank guards stationed at fixed points, and, above all, the active co-operation of artillery, constitute the surest means of checkmating the enemy's invariable outflanking manoeuvres.

The second part describes the expedition of Abd-el-Aziz to Marrakech, ending in the defeat and dispersal of his mehalla,

and his surrender to the French at Casablanca. This part also contains detailed information of great interest concerning the organization of posts, administrative arrangements of the base at Casablanca, redistribution of troops, the raising of local levies, and other measures for the pacification of the country. This concludes the narrative portion of the book. Part III. consists of a general survey of the lessons to be drawn from the campaign from the points of view of topography, tactics, staff, departmental services, and administration of the occupied territory. In the chapter on tactics the use of methods, such as marching off in a direction opposite to that of the intended objective, moving by night to within reach of the zone of attack, suppression of captive balloons, and rigid secrecy in the issue of orders are indicated as means of insuring surprise, the advantages of which in Moroccan warfare are strongly emphasized. The use of the square as a manœuvre formation is deprecated for the reasons already given.

In conclusion, it is asserted that, in the then existing circumstances, a force of 15,000 to 20,000 troops could march anywhere from the Atlas to the Atlantic, without encountering serious opposition. The supplies and communications of such a force could, however, only be assured, in the absence of a railway, by chains of posts, whose garrisons must be additional to the number given above, though, it is observed, they need not be troops of such good quality. This conclusion appears to be fully borne out by the events of General Moinier's expedition for the relief of Fez in 1911, and his subsequent operations against the tribes in the Zaer country.

William Pitt and the Great War. By J. H. Rose. 596 pp., with portraits and illustrations. 8vo. London, 1911. Bell & Sons. 16s. net.

In this volume Dr. Rose completes his account of Pitt's life subsequent to the year 1791. In it he tells the story of the dispute with France, the chief episodes of the war which ensued, and the influences which it exerted on political developments in this country.

For the soldier there is much in the book to furnish food for thought. At the present moment the reasons which induced Pitt to support and work for the Union of Ireland with Great Britain are in particular worth careful study. Of those reasons the most important, at that time, was the successful concentration of political power at the French capital which enabled that country to adopt a policy of aggression with success. In self-defence Pitt was compelled to follow suit, otherwise the power of interference without responsibility possessed by the Irish Cabinet made security impossible. It seems probable from the evidence which is put before us that Napoleon made a fatal error in going to Egypt rather than to Ireland.

But this was not the only reason why, in Pitt's view, the Union was desirable; for he also saw that, for the welfare of the country, it was essential that an end should be put to commercial disputes and religious discord, and that the only way to secure this was to unite the two countries.

Elsewhere in the book the influences which were brought to bear on the Government of the day and the reasons which induced it to despatch expeditions in so many directions in such apparently haphazard a fashion are carefully examined, and we are able to realize the difficulties with which Pitt had to contend.

The insight which is given us of the three coalitions which Pitt organized, in spite of almost overwhelming difficulties, is equally instructive. Throughout that stormy period Pitt is the dominant figure. He alone was consistent in his efforts to secure the independence of Europe, in realizing the steps that were necessary to attain that end, and in his determination to succeed. He died before his aims were accomplished, but he left behind a band of statesmen who bore witness to his wisdom and his foresight.

On this account alone, then, the book repays the time spent on it, in that it tells the history of a great Englishman who, without thought for himself, gave his life for his country.

British Battles : Blenheim ; Malplaquet. By Hilaire Belloc. 12mo. London, 1911. Stephen Swift & Co. 1s. net each.

It is understood to be the intention of the author to issue a series of monographs dealing with some of the principal actions in which British troops have taken part. The accounts of the two battles which are now published are clearly and simply told. They enable the reader, not only to grasp the chief incidents of the actions themselves, but also the strategical problems which confronted the leaders on either side and the solutions they adopted. If there is one lesson more than another to be learnt from these battles it is the value and importance of co-operation between leaders ; for, without Eugene's loyal support, it seems impossible to believe that Marlborough could ever have been successful. For that reason alone, if for no other, these little books are worth studying.

The Battle of the Boyne, together with an account based on French and other unpublished Records of the War in Ireland (1688-1691), and of the formation of the Irish Brigade in the service of France. By D. C. Boulger. 388 pp. 8vo. London, 1911. Secker. 21s.

The actual description of the fight which gives its name to this volume occupies very little space, and is not very clear, while the want of a plan of the battlefield is also felt. Mr. Boulger writes as a Jacobite, and hardly seems to appreciate the need for examining his sources of information. The most interesting part of the book is the account of the Irish regiments in France, commencing with the Mountcashel Brigade. This brigade was exchanged for a French detachment which was present at the battle of the Boyne.

The Russo-Turkish War of 1877-78 in the Balkan Peninsula. (Der Russisch-Türkische Krieg 1877-78 auf der Balkan-Halbinsel.) Vol. IV. Parts 1 and 2. 341 and 288 pp. Vol. V. 248 pp., 2 cases of maps. 4to.

Vienna, 1911. Seidel. Price: Vol. IV. (2 parts and case of maps), 22s. Vol. V. (with case of maps), 9s.

The above work is a translation by the Austro-Hungarian General Staff of the Russian official account of the war. The first two volumes, dealing with the events up to the first battle of Plevna, appeared in 1902, while a German version by General Krahmer was also produced about that time.

After the production of the first two volumes, the arrangement of the remaining volumes was altered through the interposition of General Kuropatkin, who, when he was War Minister, desired that instead of following the chronological sequence of events, the history should first deal with those events with which he was personally acquainted and in which he had taken part. The result was that the present Volume V was then prepared under the General's immediate direction; this dealt with the operations on the western front only, from 18th August to 1st September, including the third battle of Plevna.

The production of this volume necessitated the division of Volume IV into two parts—i.e., Part I, dealing with the events from 1st to 18th August on the east and south, and Part II, dealing with the events on the west from 1st to 18th August, and with those on the east and south from 18th August to 31st August.

Volume VI commences from 1st September, 1877, as originally arranged. The translation of Volume III appeared in 1906; this deals with the period of July, after the first battle of Plevna, and had also, similarly to Volume IV, to be eventually divided into two parts.

The compilation and progress of the Russian official account of the war—which, it may be remarked, is apparently a strict record of events without particular comment or deduction—seem to have rather escaped attention in this country. The German translation of the present volumes may, therefore, be of use in attracting notice to the various orders and official documents quoted, and thus supplementing the information at present existing in English studies of the campaign.

In the translation the continued repetition of the alternative dates (old and new styles) is somewhat confusing, and might, one would have thought, have been better avoided.

IMPERIAL DEFENCE.

Canada and Canadian Defence. By Major-General C. W. Robinson, C.B. 186 pp. and maps. 8vo. London, 1910. Hugh Rees. 6s. net.

In the preface to this book General Robinson points out that, though many of the questions with which the Imperial Defence Conference of 1909 dealt have been widely and closely examined, yet there is still much in connection with the defence of the Dominion of Canada which requires to be more completely understood by British subjects generally.

It is accordingly with the two-fold object of teaching his countrymen something of the geography of Canada and of its defensive needs that General Robinson has written this book.

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In Chapter 1, the author points out the importance of considering national defence as a whole. He then draws attention to the part which Canada is likely to play in the future development of the Empire, and the consequent importance of ensuring its integrity. Now, at the Conference of 1909 it was laid down as one of the principles which formed the basis of the defence organization of the Empire, that it was the duty of each self-governing nation to provide, as far as possible, for its own security. The most effective way in which to deal with this question is, therefore, in the author's opinion—a view with which most people will be inclined to agree—first to examine into the character of the frontier concerned; next to study the most recent attempt which has been made to capture the country itself; and, finally, to consider the changes which have taken place since that date, and how far the experiences of the past can be usefully applied to the present.

Chapter 2 deals with the character of the boundary line of Canada, the outstanding feature of which is the extent of her inland water frontier. At the same time it is pointed out that for many hundreds of miles her southern frontier is a purely arbitrary one, while even the water frontier is, at some seasons and in certain places, no very serious obstacle to invasion.

The deduction which is to be drawn from these conditions is, therefore, that adequate naval power working in the closest co-operation with a sufficient land force is essential to her security.

The three following chapters deal with the campaigns of 1812-1814 in considerable detail, and are well worth careful study. The effect which control of the lakes exercised on the land operations is fully brought out, while at the same time the necessity of adequate land forces to take advantage of the naval successes becomes apparent.

In the author's opinion, the teaching of this war is that with reasonably adequate, well-equipped, and well-commanded naval and military defensive forces, Canada need not be overrun, and that, in the words of the Duke of Wellington, a naval superiority on the lakes is a *sine qua non* of success in war on the frontier of Canada, even if the object should be only defensive.

Chapter 6 deals with the changes affecting defence since 1814; amongst these are to be noted some alterations in the boundary line, the introduction of steam and electricity, the construction of numerous canals and of an extensive railway system, and, as important as any, the convention known as the "Rush-Bagot Convention," by which the number and size of the armed vessels to be maintained on the lakes is strictly limited.

In Chapter 7, General Robinson briefly recapitulates the whole question, and sums up what the previous chapters appear to indicate as requisite for the maintenance of Canadian independence. The conclusion at which he arrives is that an efficient Canadian navy, together with a mobile land force, are essential to its safety.

Appendices contain an extract from the "Chicago Tribune" of

January 30th, 1898, which deals with the question of the defence of Chicago; another extract on the subject of Lake Champlain, some details of the harbours and ports of Canada, and a table showing the duties of a local headquarters' section of the Imperial General Staff.

There are also three useful maps included in the book, which is a serious and valuable contribution to the literature of Imperial defence.

MEDICAL.

Memories of the Crimean War, January, 1855, to June, 1856. By Douglas Arthur Reid, M.D., formerly Assistant-Surgeon, 90th Light Infantry. 206 pp. 4to., illustrated. London, 1911. The St. Catherine Press. 21s.

This book has been compiled with the aid of letters written in the Crimea and sent home each week by the author. His experiences and various episodes which occurred during the siege are consequently told as if they had only recently happened. They furnish a graphic description of the acute discomforts which the besieging army had to put up with, and of the excitement provided by duty in the trenches. The misery endured by the sick and wounded, which the medical officers were powerless to alleviate, must have been intense. Most of the numerous photographs have been reproduced from originals taken on the spot, and are therefore of great interest.

Field Ambulance with Field Equipment (Austro-Hungarian Army). (Die Infanterie-Divisionssanitätsanstalt mit Felddausrüstung. Militärärztliche Publikationen. Nr. 137.) By Lieut.-Col. v. Hoen, General Staff, and Dr. Szarewski, Senior Medical Officer of the 34th Landwehr Infantry Regiment. 122 pp., illustrated. 8vo. Vienna, 1911. Safar. 4s.

This handbook contains a complete description of the personnel, equipment, interior economy, and work of the Austrian field ambulance, compiled mainly from official manuals. The chapter on its tactical employment in the field gives a very complete sketch of its duties, in different military situations, and how these may best be carried out.

Tropical Hygiene for Anglo-Indians and Indians. By the Hon. Surgeon-General C. P. Lukis, M.D., F.R.C.S., C.S.I., Director-General of the Indian Medical Service, and Major R. J. Blackham, D.P.H., R.A.M.C. 164 pp., with 32 illustrations. 8vo. London, 1911. Thacker. 4s. 6d.

In the preface the authors point out that the need for instruction in sanitation is greater in India than at home. The St. John Ambulance Association has now arranged a special curriculum adapted to the sanitary needs of India, but up to the present there has been no manual to meet the requirements of Anglo-Indians and Indians who wish to obtain the Senior Certificate in Home Hygiene granted by the Association in India.

This manual has been compiled to supply this want. An elementary primer for the Junior course is also in preparation.

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The various problems of sanitation as met with in India are clearly described in simple language which can be easily understood by any one. The work should be of the greatest assistance to Europeans residing in India, as also to educated natives of India who wish to lead a healthy life and avoid contracting diseases formerly looked on as due to climate and therefore inevitable, but which in the light of our present knowledge we know to be preventable by the exercise of a little care.

A System of Signalling for Voluntary Aid Detachments. (Signale der Freiwilligen Samariterkolonne.) By Miller. 31 pp. 8vo. Dresden, 1911. Ulrich. 1s.

The signals can be made by day or night. For near distances by day the sender holds his cap in one hand, and by assuming certain positions or making certain movements can make twenty-seven different signals. At night three lanterns are used. For longer distances a mast with flags or lanterns is used.

Handbook on Military Sanitation for Regimental Officers. By Major K. B. Barnett, R.A.M.C. 176 pp. 8vo. London, 1912. Forster Groom. 2s. 6d.

This book has been compiled by Major Barnett from notes prepared for lectures on sanitation to regimental officers. It is intended as a supplement to the official manual of sanitation.

Lieut.-General Sir H. L. Smith-Dorrien, K.C.B., D.S.O., A.D.C., has written an introduction in which he points out that in the South African war we had twenty casualties from disease for every one caused by the enemy, while in the Russo-Japanese war of 1904-05 the proportion in the Japanese Army was $2\frac{1}{2}$ to 1. He emphasizes the importance of sanitation in maintaining the fighting efficiency of an army, and the fact that sanitation is not merely a concern of the medical officers, but must be understood and practised by every man belonging to the army, no matter what his position is.

The introductory chapter contains a general review of the origin and present position of military sanitation. Chapter 2 discusses the cause of disease, and chapter 3 explains the meaning of the terms used in dealing with preventable diseases. The remaining chapters give a review of the chief preventable diseases, water supplies, sanitation in barracks, in camp and on the line of march, food and personal hygiene, field service, and sanitary organization.

One or two minor criticisms may be permitted: Thus, in the introductory chapter, Major Barnett refers to the origin of the Geneva Convention, which hardly seems called for in a manual on sanitation.

Again, on page 85 the use of a tarpaulin as a receptacle for water seems a little out of place, following as it does a paragraph on "How to make charcoal."

When discussing cooking, a short description of the system of cooking by squads, as practised in the French army, would have been of

value. If this were included in the soldiers' training it would neutralize the great disadvantage of the restaurant system of messing, viz. :— that this is in no sense a preparation for the needs of war.

The frequent references to regulations affecting army sanitation should be of great help to officers.

Major Barnett has compiled a useful handbook on military sanitation written in a light and readable form; it should prove of great assistance to all regimental officers.

MILITARY FINANCE.

Modern Wars and War Taxes. By W. R. Lawson. 454 pp. 8vo. London, 1912. Blackwood. 6s. net.

In this book the author has endeavoured to supply a want which has long been felt. Every branch of military science has been exploited with the one exception of military finance, and any one who takes the trouble to read this volume will gain an insight into its immense importance under modern conditions.

In the opening chapter the author disclaims all idea of propounding new views of strategy or tactics, of discussing the ethics of war, or of writing in the interest of a political party. In consequence, his indictment of our financial unpreparedness for war carries all the more weight. Briefly, he maintains that the British Empire is at this moment destitute of a financial policy capable of bearing the strain of a serious military crisis such as that in which we may any day find ourselves involved.

This, he maintains, is due to a variety of reasons, all of which, however, ultimately depend on the fact that we are, in his opinion, in want of a definite foreign policy. Ours, he says, is often called continuous but is never intelligible, and as a consequence we possess an army and navy created for no particular purpose and without a specific plan.

The book is divided into six parts, the first of which deals with modern armaments, which must be looked upon as one of the fundamental problems of modern civilization; how they affect the British Empire; and the ever-increasing importance of food and finance in war.

Part II deals with the revenues, expenditures, debts, and taxes of the military Powers. The tables which are reproduced show some startling facts, and may well give rise to the doubt expressed by the author whether Parliament or people give a thought to the vital question how the necessary revenue for a war is to be raised without prejudicing the prosperity of the Empire. Another disquieting truth is the fact that the United Kingdom is the most heavily taxed of all the Powers, that its taxes are being multiplied, and that such financial conditions must have a prejudicial effect on its military strength and efficiency.

Part III discusses the elements of military strength. An essential factor in the military policy of a country is the study of the economic wealth, since the object of the former is to secure and maintain the

development of the latter. This involves the definition of what is meant by national wealth, which the author classifies under three heads. The first of these he calls primary wealth, which embraces the bare necessities of life, in respect of which we are very badly off as compared with other nations. The other elements he considers under the headings of "a definite margin of emergency reserves," "an intelligible foreign policy," and "an adequate army and navy." The last chapter of this part is given up to the question of the financial interdependence of the modern world, a phrase of which a good deal has been heard since the appearance of Mr. Norman Angell's book, "The Great Illusion." Mr. Lawson arrives at a very different conclusion to the author of the latter, for, as he says in a subsequent chapter, "Finance never yet prevented an outbreak of war, though it has brought many wars to an abrupt conclusion," and "the true financial problem in war is not how it begins but how it ends."

The next part deals with the elements of military weakness, of which "divided counsels" and "haphazard budgeteering" speak for themselves; other chapters show how the loss or abuse of credit will handicap a belligerent in future wars, which must be financed chiefly by promises to pay later on, and why it is important for us to maintain Consols at a high level, since they form the recognized barometer of our national credit.

The causes and effects of the depreciation of the premier British security are carefully explained, and reasons given for the gradual and inevitable disappearance of close and friendly relations between the banking institutions of the country and the national securities under our existing system.

In Part V consideration is given to war finance of the future. An effort is made to estimate what the next great war may cost, and a comparison drawn between our own methods of studying the question and preparing for such an eventuality and those of the Germans, very much to our disadvantage.

The last part is devoted to considering previous war scares and the views of the anti-militarists. In it the author exposes the fallacies which underlie the theories enunciated by Mr. Norman Angell in his book "The Great Illusion," the chief of which is the idea that the financial interdependence of modern states provides a guarantee against future wars.

While Mr. Lawson admits that different conclusions may be drawn from the array of facts he has collected, they lead him to believe that, if war is to be killed, it will be by the sheer weight of its own machinery: in other words, it is not the horrors of actual war that will stop war so much as the terrific cost of getting ready for it.

The book is one which well repays careful study, and gives information on a subject of vital importance to the Empire.

POLITICAL.

With the Turkish Forces in Albania. (Im Türkischen Kriegslager durch Albanien.) By Dr. Ernest Jäckh. 222 pp., with map and numerous illustrations. 8vo. Heilbronn, 1911. E. Salzer. 6s.

Dr. Jäckh, the author of this book, was apparently the guest of the Turkish General Staff during some portions of the 1911 Albanian operations, but his allusions to military incidents occupy but a comparatively small space in the work as a whole. A short chapter is devoted to the fighting at the Kachanik and Tchirnalova passes, and another chapter contains some military reflections during the time the doctor was at the headquarters of the Commander-in-Chief, General Shevket Torgout Pasha; but the greater number of the pages are devoted to a study of the Albanian question, the nature of the country, and the conditions of life therein.

Dr. Jäckh is careful to show that he regards "a combination of German and Turkish interests as both natural and necessary, as also a development of a Turkish-Austro-German friendship against the enveloping tactics of England."

The illustrations in the book are good, and the subjects of them well-chosen.

SMALL ARMS.

The Small Arms and Ammunition in Use in Modern Armies. (Les Armes à feu portatives des armées actuelles et leurs Munitions.) By Commandant Bornecque. 150 pp. 8vo. Paris, 1911. Chapelot. 3 vols. 9s.

This volume constitutes the third part of a series, Parts I and II having appeared in 1904 and 1905 respectively.

After a short survey of the development of small arms, the author discusses in detail the armament of 22 of the chief military Powers. Special chapters are devoted to automatic rifles, the instruction of the soldier in the use of the rifle, and the replacement of ammunition. The book concludes with comparative tables of (1) rifles, (2) carbines, and (3) pistols, in use in various armies.

As regards the future development of the rifle, Commandant Bornecque concludes that the question of a change in design is not yet ripe for decision, and that the Great Powers are, consequently, endeavouring to improve the ballistics of the existing designs by alterations in the powder and, more especially, in the form of the bullet. From a comparative table of the German and French bullets (page 62) it appears that the German "S" pattern gives the best results up to 800 metres (880 yards), but that at longer ranges the advantage is with the heavier "D" bullet of the French rifle.

The automatic rifle is still, in the author's opinion, in the experimental stage, and experts are by no means agreed as to the direction in which the rifle of the future is to develop. In this connection he quotes with approval the conditions laid down by the French War Ministry for a

new infantry rifle (page 90), and the somewhat similar conditions (page 31) published in 1909 by a committee of the British War Office. In the case of France the difficulties in the way of a re-armament (which he estimates would involve the provision of 3,500,000 rifles and an outlay of 24 millions sterling) are so great that no premature steps are likely to be taken in this direction. Automatic pistols have reached a more advanced stage, and are in a fair way to replace the revolver as a weapon for short ranges.

As regards ammunition supply, Commandant Bornecque considers that troops going into action will require a supply of 500 rounds per man, and that if automatic rifles are ever adopted this number will require to be doubled.

STRATEGY AND TACTICS.

The Evolution of the Art of War. (Les Transformations de la Guerre.) By Major J. Colin. 310 pp. 8vo. Paris, 1911. Ernest Flammarion. 3s.

This is a book of great merit, and should be read by all officers interested in their profession. It shows sound learning, practical common-sense, considerable originality, and, what is somewhat rare in military writers, moderation, for the author, who is at the French Staff College, does not often push his conclusions to extremes.

The book is divided into three parts, entitled respectively "Le Combat," "La Bataille," and "Les Opérations," and under each heading the author studies the leading characteristics of (a) wars prior to the French Revolution, (b) the campaigns of Napoleon, (c) the 1870 and other wars of the 19th century, (d) wars of the 20th century, and concludes by attempting to show what will be the principles and methods of the future war of masses.

In his study of "Le Combat," Major Colin shows how, even in the classical period, a purely frontal attack never led to any decisive result, which was only obtained by the manœuvring power of light troops or cavalry and a flank attack. With the introduction of fire-arms infantry tended to become the principal arm, and shock action was impossible without superiority of fire. Napoleon, especially, laid stress on the importance of fire, and often used his artillery to break the centre of the enemy's line. The wars of 1866 and 1870 taught the same lessons, but also proved that lines of skirmishers could carry out the assault, and that closed columns, which used to follow the firing line, were no longer necessary. The difficulties of a frontal attack became more pronounced, and consequently enveloping movements were alone capable of obtaining victory.

In his forecast of the future fight, the author warns his readers that moral qualities are, after all, the basis of success, and, like several other modern French writers, he discusses the psychology of fear.

In the chapters on the "Battle," Major Colin repeats his remarks on the importance of an enveloping attack and turning movement, and points out that the latter were only possible when armies were

capable of manœuvring. But towards the end of the 18th century, some generals, Moreau for example, in their anxiety to turn the enemy, spread out their forces in an extravagant manner. On the other hand, Napoleon, while marching on a broad front, could, and always did, concentrate his forces for the battle. His aim was generally to employ the turning movement as a means of forcing the enemy to use up his troops, and then to gain the victory by a decisive attack of reserves which the Emperor had carefully guarded.

It may surprise some readers to learn that, in the author's opinion, Moltke and his disciples preferred an enveloping attack to a bold turning movement. The Japanese at Mukden, on the contrary, made use of the latter method.

The battle of the future will probably show that an enveloping attack or turning movement is the surest method of gaining victory, and cavalry will be the most efficient arm for such movements and for a vigorous pursuit, but it must be a cavalry trained to use the rifle as well as the sword. It will be possible to hold an enemy in front with comparatively few troops, and railways may be utilized for unexpected concentrations. The two opposing armies will, in all probability, be both imbued with the doctrine of the offensive, and victory will remain with the commander who knows how to strike with the greater celerity and resolution.

That section of the book dealing with "Les Opérations" is perhaps the most interesting, for the greater part of it is devoted to a really masterly analysis of the Napoleonic system. In fact, this portion would alone entitle the book to a place on the shelf of every military library. Examples taken from the various campaigns of the Emperor show how he stood supreme in the art of so arranging the marches of large armies as to be always ready for any emergency. It may be also remarked that Major Colin on page 245, as a result of a study of Napoleon's methods, throws over the doctrine of the strategical advanced guard.

The concluding chapters of this section are remarkable for a just and generous estimate of Moltke, and for an equally just criticism of the evils of a passive offensive, by which the author means an attack founded on no proper plan or understanding of the situation, and solely inspired by a blind adherence to a system.

Movements, Combats, Fortification and Supply in Mountain Warfare. (Über Bewegungen, Kämpfe, Befestigung, und Verpflegung in Gebirgs-ländern.) By Lieutenant-General von Mürzsprung, Austro-Hungarian Army. 168 pp., 9 sketches. 8vo. Vienna, 1911. Seidel. 3s. 1d.

This book deals in a thorough manner with the subject of mountain warfare in Europe, to which great attention is directed in the Austrian Army. The subject is treated both from a strategical and tactical standpoint, and instructive examples from various European campaigns, in mountainous country during the last 100 years, are given. The nine explanatory sketches are clear and easy to follow.

The Infantry Battalion and Company in Battle. (*Procédés de combat du bataillon et de la compagnie d'infanterie.*) By Commandant Stirn. 363 pp. 8vo. Paris, 1911. Berger Levrault. 3s. 2d.

This book consists of five lectures delivered to the garrison school at Rheims during the winter of 1908-9, on minor infantry tactics.

The French Infantry Training of 1904 gave a much greater latitude to infantry officers in the training of their men than was the case in the previous edition. In consequence there was some danger that officers, in their efforts to avoid stereotyped methods, should go to the other extreme, and should reach such a state of freedom individually that would almost amount to chaos collectively. Commandant Stirn's book represents an effort to correct this tendency by laying down conclusions on almost every point in infantry minor tactics, with the arguments on which those conclusions are based.

In Lecture 1, the attack of a battalion is followed from the deployment to the assault. The formation suggested for the firing line is "line of groups;" each group is to be a definite sub-division of the company, from a squad (12 men) to a section (50 men), the groups are to be from 15 to 50 yards apart, the men forming the groups being at two paces interval. The reasons for the group formation are, firstly, that it assists control, and, secondly, that the intervals between the groups will be comparatively free from fire, and will therefore afford a good line of advance for the supports. The importance of organizing the attack before it is launched is repeatedly emphasized.

The lecture on the defensive is very well argued and expressed, but some of the author's contentions are likely to meet with considerable opposition in France. For instance, it is stated that a completely organized defensive position should include:

- Covering detachments.
- Advanced line.
- Main position.
- Successive lines in rear of the main position.
- A second line and rallying points.
- Detachments écheloned on the flanks.

This is hardly in accordance with some of the recent developments of French military thought, which have been increasingly in favour of an uncompromising offensive; those authorities who allow that a defensive attitude may, on occasion, be unavoidable, recommend that over-complication should be avoided.

The three methods of counter-attack recommended in defence are as follows:—

The "contre-offensive." Decisive counter-attack, when the attack is about 400 yards from the position.

The "contre-attaque." Local counter-attack when the enemy is close to the position.

The "retour offensif." Counter-attack by the section reserves when the enemy has captured the position.

There is a suggestive chapter on wood-fighting, in which the French have of course considerable practice. The author is of opinion that work in extended order is of little value; advances should be made in fours or company column, protected by scouts. If the enemy is encountered, a resolute charge is generally the best method of dealing with him; fire is not usually effective in a wood, and the fact of embarking on a fire fight interferes with the energy and cohesion necessary for effective wood-fighting.

By no means the least interesting part of this very interesting book is the collection of 100 tactical exercises for small units with which it concludes.

Moltke's War Lessons. Group IV. Volume III. (Moltke's *Militärische Werke*. IV. *Kriegslehren*. Dritter Teil.) By the German General Staff. 500 pp., with 51 maps. 8vo. Berlin, 1912. Mittler. 22s. 6d.

These War Lessons have been compiled by the German General Staff from Moltke's memoirs and military works. They are published in three volumes under the following headings:—

Vol. I.—The Strategical Preparation for Battle.

Vol. II.—The Tactical Preparation for Battle.

Vol. III.—The Battle.

The first two volumes have already been under review. Volume III, which has just made its appearance, contains chapters dealing with the following subjects:—

Strategy, Victory and Superiority, The Battle, The Offensive and The Defensive, Combination of the several Arms, Descriptions of Battles and their Characteristics, Breaking off the Fight, Lucky and unlucky Commanders, Historical Accounts of Battles.

There is also an index and a very complete set of maps.

The Burning Question of the Offensive. (*La Crise de l'Offensive*.) 91 pp. 8vo. Paris, 1912. Lavauzelle. 1s. 7d.

This book contains a number of letters which appeared in "*La France Militaire*" in the autumn of 1911, and aroused considerable attention in France, both on account of the interest of the topic, and because of the vigour and ability with which it was discussed.

Earlier in the year, Colonel de Grandmaison in his "*Deux Conférences*" had advocated an uncompromising offensive in the domain of Grand Tactics. In the present volume Lieutenant-Colonel Z., who opens the discussion, takes an analogous line as regards minor infantry tactics. He admits that the Regulations lay stress on the value of the offensive and that the Frenchman is, as he always has been, essentially an attacker by temperament, but he maintains that the French military education and method of fighting are not offensive.

The German doctrine is well known. It is simple, strong, and obvious, and has the defects and the advantages of those qualities. Lieutenant-Colonel Z. asserts that the French, in their efforts to find a more perfect form of war, have gone to the other extreme. In all

grades the tendency is to be too scientific and clever, to prefer the complicated, to avoid risks, to think too much of parrying and too little of thrusting, and to be unwilling to give battle without detailed information about the enemy which would never be available in war : in a word, that the French infantry are "suffocated by their own science."

The remedies suggested are as follows :—

- 1.—Will-power and judgment are to be looked on as more important qualities in an officer than cleverness and historical knowledge. More time is to be given to practical work and less to war games and tactical exercises on the map.
- 2.—The normal "training gallop" of infantry should be from 1,200 mètres from the position to the position itself. There may be many methods of crossing these 1,200 mètres, but there is here no room for "manœuvre" or hesitation. Units should be incessantly practised in crossing this zone, and officers should devote the main portion of their faculties to perfecting themselves and their men in doing so.
- 3.—It should be the rule to make up at least one company per battalion to war strength when training.
- 4.—Units should normally be trained in line-of-battle fighting on a restricted front.
- 5.—Every attack should conclude with an assault.

The very vigorous opinions of Lieutenant-Colonel Z. are most uncompromising, and it is perhaps not surprising that none of the other correspondents go quite as far as he does ; at the same time, they all admit that some, at least, of his views are well founded.

Lieutenant-Colonel Savetier, the distinguished author of "*Thèmes tactiques d'infanterie*," points out that to limit the art of war to a single form of crude attack would be to produce a remedy that is considerably worse than the disease. In his opinion, the time of officers is so filled with instructing their men at high pressure that they have no time to instruct themselves.

Another well-known military writer, Colonel Cordonnier, contributes an interesting letter. He traces the gradual renaissance of the French army after the stupor engendered by the disasters of 1870. The cavalry were the first to recover, partly owing to the reputation for gallantry that they acquired even in 1870, partly to the influence of de Galliffet.

The artillery recovered more slowly, but, thanks to the excellence of their present material and to the teaching of Generals Langlois and Percin, they are now filled with the spirit of the offensive.

The infantry too have successfully fostered the offensive spirit as is shown by the dash of their attacks at manœuvres both in 1910 and 1911. Colonel Cordonnier maintains that there is no "burning question of the offensive," but he admits that a doctrine concerning the handling of armies is undoubtedly wanted, the theory of the direct intervention of the Commander-in-Chief by means of a General Reserve being only applicable to comparatively small units.

A Second Series of Tactical Schemes with Solutions. (Deuxième Série de Travaux tactiques: thèmes et solutions.) 370 pages. 8vo. Paris, 1911. Chapelot. 4s. 2d.

This book is a collection of tactical problems which appeared in the "Journal des Sciences Militaires" between October, 1909, and July, 1911. The exercises, which are 18 in number, form a connected series based on a "General Idea" framed by General Bonnal; each scheme consists of a "Special Idea" and of 4 or 5 problems, the solutions to which are given at the end of the scheme, followed, in some cases, by a short narrative, which sustains the interest and serves as an introduction to the "Special Idea" of the next scheme. The solutions and narratives are illustrated by numerous maps, and, in one case, by a panorama sketch of the ground.

The "General Idea" is based on the situation of the French and German forces on the 26th August, 1870. The 1st and 2nd Armies of the "Eastern" nation have blockaded the 1st "Western" Army in the fortress of Metz; the 3rd "Eastern" Army is advancing south of Verdun in the direction of Paris; a 2nd Western Army, consisting of five Army Corps, has been concentrated near Rheims with orders to relieve Metz, or, if this should not prove feasible, to retire on Paris, delaying the invaders as much as possible. The positions of the various Corps of the 2nd Western Army at the outset of operations, and of the enemy's cavalry, so far as it is known, are shown graphically on a map at a scale of about 8 miles to the inch.

The general course of the operations are, briefly, as follows:—Soon after the 2nd Western Army has commenced moving eastwards, its commander becomes aware that the 3rd Eastern Army, which is opposed to him, has discovered his intention and is changing direction northwards, so as to envelop his left flank should he persist in his advance. He accordingly resolves to retire on Paris, but decides to cover this movement by first dealing a crushing blow towards the south at a detached portion of the enemy's left wing, which is separated by the Argonnes from the main body of the Eastern Army. The 5th Corps, which has been acting as general advanced guard to the Western Army, is charged with the delicate duties of masking the change of direction towards the south, and leading the enemy to believe that the advance eastward is being continued; in carrying out the above tasks, this Army Corps becomes engaged with superior forces of the enemy and has then to break off the action and fall back fighting, without, however, becoming committed to a decisive battle. Meanwhile the main portion of the 2nd Western Army accomplishes its purpose, and attacks the detached wing of the Eastern Army on the Yevre, south of St. Menes, enveloping its left flank and driving it northwards. After pursuing for a short distance, the Western Army commences its retirement on Paris via Chalons and Rheims. The whole period covered by the narrative is from the 25th to the 29th August.

The schemes are intended not only for candidates for the École Supérieure de Guerre, but for officers of all arms who desire practice

in staff work and the solution of tactical problems. It may, however, be said at once that the book presumes professional knowledge of a high degree on the part of the reader. It is true that many of the schemes, notably No. 11, include the operations of small detachments, but for the most part they are concerned with questions of high leadership. In the great majority of cases the tactical orders or dispositions required are those of the Army Corps or Cavalry Corps commanders, in circumstances which are sometimes of more than ordinary difficulty—as for instance that of the 5th Corps cited above—while the staff work includes such tasks as the dispositions of an Army Corps in billets or the arrangements for filling up the supplies of an Army Corps at the end of a day's march.

In spite of the magnitude of the forces dealt with, the "Travaux Tactics" are in many ways suited for the study of officers in this country, provided that the readers are able to distinguish any points in which the solutions offered differ in principle from the teaching of our own training manuals. It will be found advisable, before commencing the study of the book, to draw up an "order of battle" for an Army Corps and a division of the French Army, and to obtain data for the road spaces of units larger than a battalion.

The schemes certainly succeed in the object, which is set forth in the preface, of creating situations which shall teach officers to think on definite lines. Among the most interesting solutions are the arrangements made by the commander of the 5th Corps (page 58) for misleading the enemy as to the direction taken by the 2nd Western Army; the dispositions of the Cavalry Corps (page 229) with a view to performing the quadruple duties of gaining information, covering the right flank of the Army, concealing the movement of a Corps which is coming up as a reserve in rear of this flank, and, eventually, co-operating in the expected battle; and finally the execution of the attack by the 12th and 13th Corps (page 530) against the enemy's left flank on the Yevre.

Infantry in War. (*L'Infanterie à la Guerre.*) By Capitaine A. Balédent, with a preface by General Bazaine-Hayter. 292 pp. 8vo. Paris, 1911. Chapelot. 4s. 2d.

This book is a collection of exercises which were originally framed for the instruction of a class of young aspirant officers of the Reserve. These youths would be required, in case of war, to act as section commanders of infantry companies, and the exercises are therefore only concerned with the operations of very small bodies—not more than a section in some cases—though in the later schemes forces as large as a company are dealt with. It appears that the author has been criticised for not confining his teaching strictly to the duties of a section commander, but his action is approved of by General Bazaine-Hayter, who insists, in the preface, that a section commander's horizon must be wide enough to include all the operations of the company considered as a whole.

The system of instruction pursued by Captain Balédent is based on General Foch's maxim, "Know what is your object and what are your means, and you will then know how to act."

In pursuance of this principle, Captain Balédent devotes great pains to teaching his pupils to approach the solution of all problems by a reasoned chain of argument, starting from the data given in the special idea and working up to the commander's decision for action. He has endeavoured to reduce this process to a formal system on lines which are expounded in the opening chapter, and may be outlined as follows:—The author first points out that every tactical problem consists, primarily, of a "task" to be performed, and insists on the student first discerning the nature of this task and keeping it constantly in mind throughout the subsequent proceedings. Having grasped this fundamental conception, the next stage is to deduce from it what Captain Balédent terms the "governing idea" (*l'idée directrice*) of the problem. Thus, in the case of a flank guard, the governing idea is to *interpose* between the enemy and our own main body. This idea in turn gives rise to further considerations as to *where?* and *when?* (or *for how long?*) For instance in the case of a flank guard detachment the commander is led on from the idea of *interposition* to the consideration of the *distance* from the main body at which the interposition must take place in order to be effective, and *for how long* he must maintain it in that position. These factors, which the author describes as those of "duration" and "manœuvre," take a leading part in the determination of the objective, which constitutes the next stage in the chain of reasoning.

When the objective has been determined, the question inevitably arises: What can the enemy do to frustrate our intention? This involves considerations such as: study of the roads by which the enemy might enter the zone in which the detachment has to operate; and examination of the information available about the enemy; the latter consideration inevitably gives rise to a desire for more information, and hence to endeavour to obtain it. After considering what the enemy can do to hinder us, the problem becomes how to attain our object in spite of his efforts; for this we require freedom of movement, which involves detaching portions of our force—such as outposts, advanced guard, etc.—in order to retain freedom of manœuvre for the main body. And so the student is led, step by step, to the elaboration of a plan of action and to the forming of orders for its execution. The whole process is recapitulated in tabular form at the end of the chapter.

This arrangement of ideas is not claimed by the author in any sense as an original discovery; he has, in fact, merely analysed the mental process gone through by every individual who forms a decision or plan of action. It may be objected that such a method of teaching is too rigid and is unfavourable to the development of qualities, such as spontaneity and imagination; the objection might, we think, hold good in the case of students already possessing some tactical knowledge,

but those of us who have had experience in instructing cadets, N.C.O's., or junior officers of the Territorials, will be inclined to agree with the author as to the necessity of teaching the pupils to organize their ideas in a logical and uniform sequence, during the early part of their tactical education, even at the risk of appearing a little academic.

The book contains 46 exercises, each consisting of a simple special idea and four or five problems, followed by a solution in which the principles explained above are demonstrated; the schemes are progressive, though there is no general idea running through them all.

For instance, in the last scheme but one (page 255) a detachment has been sent out to protect the flank of the main body which is engaged with the enemy. The commander at first selects a point at some distance from the main body where the ground allows of his detachment falling back from ridge to ridge, thus keeping the enemy off as long as possible. Finding himself anticipated by the enemy at the point in question, the commander selects a position much nearer to the main body, but more suited for protracted defence, thus endeavouring to gain the necessary time in another way. This is cited by the author as an illustration of the principle of adapting the means to the end in view.

The Marching of Armies. (Les Grandes Marches d'Armées.) By General H. Bonnal. 65 pp. 8vo. Paris, 1911. Chapelot. 1s. 2d.

The appearance in the "Revue d'Histoire," during 1911, of a series of articles on the "Marching of Napoleon's Armies" has induced General Bonnal to return to the discussion of a theme which he first urged on the attention of the French army as early as 1888.

The science of moving large bodies of men over the maximum distance in the minimum time may be said to have originated with Napoleon, who brought it to a standard of excellence to which it has never since attained. Indeed, it appears to have received little attention from military students during the fifty years following on Waterloo, and to have been practically rescued from oblivion by Moltke after the close of the Austro-Prussian War in 1866. The march dispositions of the Germans in 1870 have many points of resemblance with those of Napoleon's army in 1806, though in the opinion of General Bonnal, they cannot bear comparison with their model.

In the words of the late General Maillard, one frequently hears it said that the maximum day's march for an Army Corps is 15 miles in seven hours; but this estimate, he points out, is based on the assumption that the whole Corps is concentrated at the beginning and end of the day's march, and that, consequently, if the head of the column marches off at 5 a.m., the rear unit cannot start till six hours later, and has therefore only seven hours available for marching (*i.e.*, till 6 p.m.).

If, however, the Army Corps is not intended to concentrate at the end of the day there is no reason why the head of the column should not continue its march, and, if the Corps is billeted each night in a

depth corresponding to the length of the column, marches of 12 hours may then be performed for several days in succession.

The disposition in depth at the end of the day's march also possesses obvious advantages from the point of view of accommodation and utilization of local sources ; in this connection General Bonnal contrasts the situation of the Army of Chalons (14th to 26th August, 1870), whose Corps concentrated every night, with that of the German IIIrd Army which adopted the Napoleonic system and, while performing longer marches, was better off for supplies.

As, however, an Army Corps marching in this way must eventually close up in order that it may be concentrated for battle, it is advisable that the rear of the column should perform somewhat longer marches than the head, so that the process of closing up should be accomplished as gradually as possible.

The best material for the study of this aspect of the question is to be found in the history of Napoleon's Campaign in Germany in 1806. For example, at the close of the day's march on the 7th October, 1806, we find Bernadotte's Corps (20,000 infantry besides other arms) occupying a depth of 14 miles ; on the following day the head of this column marched 25 miles and the rear 30 miles, so that the Corps was billeted that night in a depth of $7\frac{1}{2}$ miles. Similarly Davoust's Corps occupied a depth of $12\frac{1}{2}$ miles on the evening of the 7th, and closed up to $7\frac{1}{2}$ miles on the 8th, on which day the head marched $27\frac{1}{2}$ miles and the rear 32 miles. This process was continued until, on the eve of battle, each Corps was concentrated in bivouac at the close of the day's march.

As an illustration of the staff work involved in movements of this kind, General Bonnal reproduces a scheme, which was set when he was on the staff of the École Supérieure de la Guerre in 1888, together with his own solution and that of General Maillard. The problem was to move an Army Corps already on the march, to a place 47 miles distant where it was to be concentrated at the end of the third day ; as the road was only to be available during certain hours of each day the distances to be traversed by the head and the rear of the column, respectively, on each day required somewhat nice calculation. The solutions contain examples of graphics, such as any staff officer can construct for himself, by which calculations of this sort may be simplified.

In conclusion, General Bonnal observes that, with the large numbers which would nowadays be brought into the field in a war between France and Germany, the unit would no longer be the Army Corps, nor even the Army, but the Group of Armies. An Army of 3 Corps would, he suggests, occupy at the close of each day's march a square of $12\frac{1}{2}$ miles side—or of 19 miles side if the Army has 4 Corps. A Group, consisting of a central Army of 4 Corps with 2 flank Armies of 3 Corps each (not including parks and convoys) might occupy a rectangle with 60 miles front and 40 to 50 miles side, allowing for intervals of 6 to 9 miles between Armies of the same Group.

The reasons advanced by General Bonnal in favour of a disposition in depth for a column halted at the end of a day's march, appear to apply with equal force to the movements of formations smaller than an Army Corps. The subject is, therefore, one that is well worthy of study in this country.

Clausewitz. By Colonel Camon. 267 pp. 8vo. Paris, 1911. Chapelot. 3s. 2d.

Colonel Camon, well-known for his studies of the Napoleonic campaigns, gives us in the present volume a critical analysis of the works of Clausewitz, concluding with some most interesting chapters concerning the influence of the great Prussian writer on military thought in Germany, both before and since the successful campaigns of 1866 and 1870. Clausewitz's most celebrated work, "On War," has about 50 pages devoted to it, the remainder of the critical portion of the book dealing with his studies of the campaigns of 1796, 1812, 1813, 1814, and 1815.

Colonel Camon began this book in 1900, in order to counteract what he looked upon as the infatuation for Clausewitz which was apparent in the French army; since 1900 a considerable reaction has set in, and the danger at present is that the ideas of Clausewitz may receive too little, not too much, attention. He did not, in the opinion of Colonel Camon, grasp the real essence of the art of war as practised by Napoleon, namely the moral demoralisation of the enemy. This is by no means to be wondered at, as a man who actually took part in the campaigns under discussion would find it difficult if not impossible to look on them with the necessary detachment for accurate historical analysis, while in addition he did not have at his disposal much documentary evidence which has recently been published, such as the 32 volumes of Napoleon's correspondence. Apart from this, the works of Clausewitz must still, in the author's opinion, be looked upon as military writing of the first order. They were the base on which the German General Staff founded their doctrine, and their effect is still manifest in the recent writings of Von de Goltz, Von Scherff, and Von Caemmerer.

The influence of Clausewitz on the strategy of von Moltke is traced in some detail, especially as regards the latter's projected defence of Berlin in 1860 by a flank position. In the domain of tactics his influence is less marked, von Moltke's doctrine of "fixing and enveloping" finding more favour in Germany to-day than the careful framing of the battle with a view to decisive attack recommended by Clausewitz.

The Higher Leadership in the most recent Campaigns Strategically and Tactically Considered. (*Die Führung in den neuesten Kriegen-Operatives und Taktisches.*) By Major-General Freiherr v. Freytag-Loringhoven. 110 pp., and 7 sketch-maps. 8vo. Berlin, 1912. Mittler & Son. 2s. 9d.

This book is apparently the first of a series which are to be brought out under the title given, the campaign chosen as a commencement

being the Russo-Turkish operations in Europe in 1877-78, the Russian leadership being that specially dealt with.

The author mentions that the Russo-Turkish campaign has been selected, because a study of the Russian leadership there may enable one to understand much that is at present difficult to comprehend in regard to the conduct of affairs in Manchuria. Moreover, a study of the 1877-78 campaign has been made especially interesting of late by the appearance of the diary of the Russian General v. Hasenkampf. This diary consists of 116 letters, the writer having served as Colonel of the General Staff during the campaign.

Further numbers of this series will deal with mountain campaigns (the Occupation of Bosnia for example), the Servian-Bulgarian War of 1885, the Turco-Greek War of 1897, the Chilian Civil War of 1891, the Chinese and Japanese operations of 1894-95, and the fighting in Cuba in 1898. Finally, special attention will be paid to the Manchurian and South African campaigns.

TRAINING AND EDUCATION.

Fire Problems. By Major-General T. D. Pilcher, C.B. 72 pp. 16mo. Allahabad, 1911, Pioneer Press; and London, 1912. Hugh Rees. 1s. 6d.

This little book consists of a series of 25 Fire Problems for forces varying from a battery of field artillery and an infantry brigade to a file. They are all the result of practical experience, having been set at various times by Major-General Pilcher to his own brigade in India. Their object is to show the great importance of skilful fire direction and fire control. As General Pilcher says in his introduction:—"A bad game shot will kill more birds with an old scatter gun, which will cover the whole face of a barn, than he will with a choke-bore, and a captain who gives wrong ranges and fails to appreciate the fire situation properly, will inflict less loss on an enemy with a company of marksmen than with a company of third-class shots, who would be the equivalent of the old scatter gun in my simile. . . . A good commander with a good shooting company will always beat a similar commander with an indifferent company; but do not give your choke-bore to a tyro. We have the choke-bore, let us teach the man behind it how to use it in all circumstances." The book should be of great assistance to all who are responsible for instruction in fire tactics.

MISCELLANEOUS.

The Sudanese Soldier. (Le Tirailleur Soudanais.) By Captain Marceau. 79 pp. 8vo. Paris, 1911. Berger Levrault. 2s.

This pleasantly-written book contains an interesting description of the native soldier of the French Central African army. Captain Marceau thoroughly appreciates the military virtues of the Sudanese, but is of opinion that these are likely to deteriorate if transplanted to Algeria; he is of opinion that any attempt to develop "La force (1594)

noire " on a large scale is unlikely to be successful, even if the expense of such an experiment were not prohibitive.

Comments on Military Questions and Current Affairs. (Questions de critique militaire et d'actualité.) By General H. Bonnal. 203 pp. 8vo. Paris, 1911. Chapelot. 2s. 4d.

This little collection of essays and articles from the pen of the distinguished French writer, General Bonnal, deals with a variety of subjects tactical, historical, and personal. In the latter category are included biographical notices of the late General de Galliffet, the hero of Sedan, of the late Georges Gilbert, author of the "Essais de critique militaire," and of General Cherfils, the cavalry commander, formerly on the staff of General de Galliffet, all written in terms of warm admiration, but tinged with extreme bitterness against the ruling authorities.

The two first articles reveal General Bonnal's marked distrust of the school of tactical thought, of which General Percin is the chief exponent. In the first article (*L'Infanterie aux Grandes Manœuvres*) he contends that General Percin's views on the speed at which infantry can advance during an attack are based on the experience of manœuvres rather than of war; he then proceeds to urge that no matter how slow the advance to the final fire position may have been, the assault itself should be carried through in the minimum time. In the second article he again joins issue with General Percin on the subject of communication between infantry and artillery in battle.

General Percin relies too much, in the author's opinion, on material means and on over-systematized methods of communication which may work well, up to a point, at an artillery practice camp, but which would fail in war; on the other hand he takes too little count of the importance of moral factors, such as the spirit of comradeship, unity of doctrine, etc., which, General Bonnal contends, may be developed until mutual co-operation becomes almost an instinct, as is evidenced by the admirable co-operation of the artillery and infantry of the 11th Army Corps at Woerth.

In "Napoléon et la marche sur Vienne" General Bonnal discusses Napoleon's failure to follow up the Archduke Charles after the latter's defeat at Eckmühl (April, 1909). The decision to move on Vienna was, in his opinion, a grave error, and must be attributed to a certain deterioration of character, the result of over-weening self-confidence, which obscured his judgment. The "Campagne de Sedan" gives, in the form of personal reminiscences of a battalion commander, a tragic picture of the indiscipline and disorganization of MacMahon's army. In "L'Armée Française de 1870" General Bonnal combats M. Emile Ollivier's assertion that the French army was really ready for war in 1870; he insists, with apparent reason, that the mere existence of the troops and munitions cannot be said to constitute readiness, if the organization for employing them is totally lacking; the whole system of command and staff organization was, he maintains, based on the Napoleonic model, which presumed the availability of a genius as

Commander-in-Chief, instead of relying on a high average level of ability among a well-trained General Staff.

The last of the historical essays gives a pathetic account, not without a touch of humour, of the misfortunes of four veteran dragoon regiments of the Army of Boulogne, who had been dismounted with a view to finding fresh horses in England, and, on the transfer of the army to the Rhine (1805) found themselves, to their mortification, making forced marches with the infantry, amid the jeers of other cavalry regiments, composed largely of raw conscripts. The murmurs of the indignant dragoons at length reached Napoleon's ears, and immediate orders were issued for these men to be exchanged with conscripts from the mounted regiments; but it was too late, as the mounted troops had already gone forward out of reach. The dragoons appear to have suffered so seriously in *moral* as a result of this treatment, that they fell into disfavour with Napoleon for many years.

The Irrigation of Mesopotamia. By Sir William Willcocks, K.C.M.G., F.R.G.S. 2 vols. 136 pp., with 46 plates. 4to. London, 1911. Spon. 20s.

In this book Sir W. Willcocks brings up to date his description of the valley of the rivers of Mesopotamia and his projects for the irrigation of that region. His original observations were first embodied in pamphlet form in 1905, subsequently to which he was engaged by the Ottoman Government as adviser in connection with the projects proposed. These, if completed and properly maintained, will, in his opinion, have the effect of restoring to Mesopotamia the prosperity which it enjoyed in ancient days.

The work outlined may be grouped under three main headings:—(a) Storing the surplus flood water of the Tigris and Euphrates; (b) Distributing the water to localities where needed; (c) Improving the navigation of both the Tigris and Euphrates by regulating the flow into proper channels. The total cost of the whole undertaking is estimated to be £T.29,000,000, and it is stated that rents, tithes, and other incomes would produce a return of 9 per cent. on the original cost.

No estimated time is given for the completion of the works, the preliminaries of which have now been going on for some years, but the question of funds is no doubt the ruling factor, and it does not appear that the Ottoman Government has yet been able to allot any substantial sum.

Sir William himself is now reported to have severed his connection with the Government, but it is understood that this will not interfere with the eventual further prosecution of the schemes.

Handbooks on the Balkan Peninsula. (Zur Kunde de Balkanhalbinsel.) By Dr. Carl Patsch. Heft 12. 92 pp., with illustrations and map. 8vo. Serajevo, 1911. D. Kajon. 2s. 6d.

This work, which deals with the physical geography and early history of the Dobrudsche, is of no great practical use for the ordinary military

reader, being better suited for the library of an antiquarian or a professor of history.

Behind the German Façade. (*Derrière la façade allemande*). By P. D. 106 pp. 8vo. Paris, 1912. Chapelot. 9½d.

These articles appeared in the French newspaper "*La Dépêche*," during the autumn of 1911; they constitute a detailed analysis of the present condition of the German army, with a view to ascertaining if the military virtues which existed in that army in 1870 have augmented or diminished during the ensuing 40 years of peace. The military and financial organization of the German Empire is reviewed, there is a brief note on the characteristics of the German officer, and in the last chapter the strategical situation of the Powers of the Triple Alliance and the Triple Entente is shortly appreciated.

The book is pleasantly written, and, while the author makes no claim to have written an exhaustive strategical treatise, he has obviously devoted considerable time to the study of his subject.

MAGAZINE ARTICLES.

AERIAL NAVIGATION.

Progress in Aeronautics. By Major H. Bannerman-Phillips. U.S.N., December, p. 321 ; January, p. 447 ; February, p. 555.

The Aeroplane as an Aid to the Solution of Existing Strategical Problems. By Captain C. J. Burke, R. Irish Regt. J.U.S.I., December, p. 1625.

The Air Age and its Military Significance. By Lieutenant G. A. Taylor (Australian Intelligence Corps). C.M.I., November, p. 671.

The Solution of the Mystery of Bird Flights. By G. L. O. Davidson. N.C., January, p. 75.

The Aeroplane of the Future. By C. Grahame-White. N.R., January, p. 732.

French Military Aviation in 1911. By T. F. Farman. B.Mag., January, p. 133.

The Stresses on Monoplane Wings. E., 12th January, p. 53.

Aviation. By Lieutenant T. H. Sebag-Montefiore, R.F.A. P.R.A.I., January, p. 436.

Aircraft in the Foreign Manœuvres of 1911. By Major H. de B. Miller, D.S.O., R.F.A. P.R.A.I., January, p. 163 of Reports, &c.

Aeronautical Notes. J.U.S.I., January, p. 116 ; February, p. 277.

Military Aeronautics in France. By Lieutenant B. H. Barrington-Kennett, Grenadier Guards. J.U.S.I., February.

Trials with Zickendraht's new aerodynamic instrument (an apparatus for measuring the strength and direction of air currents). By L. Austerlitz, Dr. Phil. and Lieutenant, Austrian Artillery. M.A.G., December, p. 1103.

Aviation at the Italian and Russian Manœuvres of 1911. By Captain Engel, Austro-Hungarian Army. M.A.G., January, p. 38.

Aeroplane Ballistics. By P. Charbonnier, Chief Engineer of French Marine Artillery. R.d'A., December, p. 133.

Aiming Apparatus for Aeroplanes and Dirigibles. By M. Brocq. R.d'A., December, p. 154.

Infantry Fire against Aerial Targets. By Commandant S. Renard. J.S.M., January, p. 60.

Recent progress in Aeronautics. O.M.Z., January, p. 131.

The employment of Aeroplanes and Dirigibles. By Naval Lieutenant Lafon. L.S.M., p. 226.

ARTILLERY.

Universal Projectiles. By Colonel H. A. Bethell (late R.F.A.). P.R.A.I., December, p. 371.

A Note on "Artillery Training." By "Field Gunner." P.R.A.I., December, p. 380.

The Defence of a Fortress against Aerial Attack. By Lieutenant J. W. Marsden, R.G.A. P.R.A.I., December, p. 384.

The Unsteadiness of Projectiles. By F. Wolley-Dod, Esq. P.R.A.I., December, p. 405.

Horse Artillery Practice in 1911. A.N.G., December 30th, p. 1236.

Some Notes and Suggestions on the Control of Divisional Artillery in, or for, the Battle. By Major W. H. F. Weber, R.F.A. P.R.A.I., January, p. 417.

Musketry for the Royal Garrison Artillery. By Captain C. I. D. Freeter, R.G.A. P.R.A.I., January, p. 459.

Notes on "L'artillerie aux manœuvres de Picardie en 1910." By Major H. M. de F. Montgomery, R.F.A. P.R.A.I., February, p. 173.

Ballistics, penetration and explosive effect of heavy projectiles. By Lieutenant de Georgi, Austrian Artillery. M.A.G., December, p. 1111.

Application and Control of Fire with large Field Artillery units. By Captain Lemner, Austro-Hungarian Army. M.A.G., January, p. 1.

Impact and Effect of Artillery Projectiles. By Lieutenant Georgi, Austro-Hungarian Army. M.A.G., January, p. 12.

The Writings of General Giovanni Cavalli. By Colonel Erle and Lieutenant Erle. M.A.G., January, p. 43.

The Field and Heavy Artillery in the Russo-Japanese War, and the influence of the experience gained there on the present employment of German Artillery. By Captain Marbach. M.W.B. Beihefte (9-10), 1911, p. 283.

A Shell for anti-balloon guns. K.T.Z., 1911, p. 404.

A new Rifle Grenade (Quisling). K.T.Z., 1911, p. 410.

Five years of Inspection. (Concluded.) By General Percin. J.S.M., January, p. 5.

The alleged disagreement between two Regulations. A short reply to General Percin. By Gunner F. J.S.M., 15th January, p. 203.

The Employment of Artillery. By Lieutenant-Colonel Sündermann. O.M.Z., January, p. 33.

Artillery in Action. By Colonel de Margerie. R.M.G., January, p. 17.

Artillery tendencies. By Commandant Louis. R.M.G., January, p. 75.

Armour and Ships, translated from the Journal of the United States Artillery. By Captain Veit, Austro-Hungarian Army. M.A.G., February, p. 112.

Instructions for the tactical handling, fire discipline and control of Russian batteries armed with the 3" Q.F. gun. Translated from the Russian. M.A.G., February, p. 127.

The Employment of Artillery in the Cavalry Manœuvres at Somogy in 1911. By Captain Sponer, Austrian Horse Artillery. K.M., February, p. 90.

CAVALRY.

The Training of a Remount. By Lieutenant S. J. Hardy, Royal Scots Greys. C.J., January, p. 1.

Worthy of their Steel. By Colonel E. A. Herbert, M.V.O. C.J., January, p. 19.

Machine Guns with Cavalry. C.J., January, p. 34.

The German Cavalry Manœuvres of 1911. By Cecil Battine. C.J., January, p. 47.

The New Italian "Cavalry Training." By Colonel H. C. Wylly, C.B. C.J., January, p. 53.

Army Cavalry in the German Kaiser Manœuvres, 1911. By Colonel von Unger, German General Staff. K.M., December, p. 910.

The Employment of Cavalry in close country (with a sketch). K.M., December, p. 950.

The march of a squadron from Pardubitz to Galicia and its experiences at Imperial Manœuvres in 1900. By Major von Ravelsberg. K.M., December, p. 957.

Amateur race riding. 1st part. Flat racing. By Major von Stetten. K.M., December, p. 969.

The Berlin long distance ride. By Captain Freiherr von Eschbeck, German Army. K.M., December, p. 975.

"Let us make no exaggeration." (A comparison of the French and German Cavalry.) By F. T. R.C., December, p. 610; January, p. 83.

A doctrine on the employment of cavalry in battle. By General P. Durand. R.C., January, p. 5.

The working of the means of transmitting intelligence in the Austrian manœuvres. K.M., November, pp. 826-830.

A new cure, Salvarran, for diseases of the chest among horses. K.M., November, p. 831.

What to do with lances, when fighting on foot. K.M., November, pp. 831-834.

Equitation in the Cavalry of Frederick the Great. K.M., November, pp. 834-836.

Cavalry in Modern European Warfare. By Colonel Popovici, Roumanian Army. K.M., November, p. 837.

Reminiscences of an Aide-de-Camp with Benedek's Army in 1866. By Freiherr von Ditforth. K.M., November, p. 839.

Accounts of recent long distance rides in Austria. K.M., November, p. 848.

French views on strategy and tactics. By Major-General von Gersdorff. K.M., November, p. 869.

The causes of shying in horses. By Colonel von Spohr. K.M., November, p. 872.

Health and fitness of troop horses in Germany. K.M., November, p. 876.

Horse supply in the French Army. K.M., November, pp. 877 and 879.

A Staff Tour round Graz. K.M., November, p. 878.

The Brazilian Cavalry. K.M., November, p. 880.

Current Sport in the Austrian Cavalry. K.M., November, p. 881.

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(ii) The N.C.O. question.

(iii) Bernhardt's views on the value of cavalry in battle and on the inexpediency of forming cavalry divisions in peace time.

K.M., February, p. 81.

Cavalry in future wars. By General von Unger. K.M., February, p. 88.

General von Seydewitz, a Bavarian Cavalry Leader. K.M., February, p. 105.

Riding competitions in Vienna. By Major von Ravelsburg. K.M., February, p. 121.

The long distance ride from Ragusa to Sarajevo. By Captain Waldbauer, Honved Army. K.M., February, p. 136.

Long distance trotting trials of harness horses in Brittany. K.M., February, p. 151.

DEFENCE, HOME AND IMPERIAL.

The Blue-Water School and the late Crisis. By "Strategist." N.R., January, p. 713.

Cabinets in Relation to War. N.D., Christmas, p. 483.

The Misheni Mission. By Angus Hamilton. F.Rev., March, p. 553.

The military intervention of England on the Continent. J.S.M., February, p. 273.

FORTIFICATION AND MILITARY ENGINEERING.

Some Notes on Field Works. By Major J. C. Matheson, R.E. R.E.J., February, p. 73.

A Pontoon Bridge for Steam Transport. By Captain W. L. Carey, R.E. R.E.J., February, p. 81; March, p. 141.

The Tactical Employment of Field Defences. By Major E. D. Swinton, D.S.O., R.E. P.R.A.I., February, p. 463.

Topographical Survey in Tropical Africa. By Captain G. E. Bolster, R.G.A. P.R.A.I., February, p. 477.

Simple bridging and data for bridging expedients on service. O.M.Z., December, p. 2057.

Technical preparations for the passage of rivers. By Captain Bachl, Austrian Engineer Staff. M.A.G., February, p. 87.

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Italy's Last War in Africa. By Colonel H. C. Wylly, C.B. U.S.M., December, p. 252.

The Defence of Mangalore. By Captain C. B. Norman. U.S.M., December, p. 311.

Ahmed Pahsa Arâbi. By W. B.Mag., January, p. 57.

Great Cavalry Leaders—Lasalle. By Brigadier-General H. de B. De Lisle, C.B., D.S.O. C.J., January, p. 78.

The Study of Military History. By "N." U.S.M., February, p. 496.

A short account of the Military Operations on the Mekran Coast. By Lieutenant H. Kenyon, R.A. P.R.A.I., February, p. 483.

The War in the Mediterranean. J.U.S.I., February, p. 247.

Our War with Persia in 1856-57. By Colonel H. C. Wylly, C.B. U.S.M., March, p. 642.

Italy and Tripoli. O.M.Z., December, p. 1969.

The Disturbances in China. O.M.Z., December, p. 2047.

The Campaign on the Upper Guir in 1908. (Continued.) By Lieutenant C. Pellerin. J.S.M., January, p. 88; February, p. 354.

Napoleon in the Field. (Continued.) By Lieutenant-Colonel Vachee R.M.G., December, p. 729; January, p. 86.

Essays on the Russo-Japanese War. (Continued.) By Captain de Saligny R.M.G., December, p. 746; January, p. 102.

The Battle of Solferino. O.M.Z., January, p. 3.

Italy and Tripoli. O.M.Z., January, p. 57; February, p. 227.

The March of Davoust's Corps from the Isar to Vienna in 1805. O.M.Z., February, p. 187.

Moltke as Chief of the General Staff in peace. By Captain Schäfer. O.M.Z., February, p. 211.

"The Russo-Persian conflict." By Lieutenant-Colonel Burstyn. O.M.Z., February, p. 303.

"The Russo-Japanese War, experiences of combatants." O.M.Z., February, p. 309.

Winter Campaigns in which the Swedish Army has taken part. K.V.A., Tids. No. 22, 1911.

MEDICAL AND SANITARY.

The Story of the British Army Surgeon and the Care of the Sick and Wounded from 1689 to 1702. By Major A. L. Howell, R.A.M.C. J.R.A.M., December, p. 643.

A Lecture on Mobilization. By Lieutenant-Colonel E. M. Wilson, C.B., C.M.G., D.S.O. J.R.A.M., February, p. 181.

The Sanitary Care of the Soldier by his Officer. By Brigade-Surgeon Lieutenant-Colonel G. J. Evatt, M.D. J.R.A.M., February, p. 188.

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The Conveyance of Wounded in Canal Barges. By Lieutenant-Colonel R. Jackson, R.A.M.C. (T.F.) J.R.A.M., December, p. 627.

Second Experimental March to Investigate Amount of Food required by Men on Active Service. J.R.A.M., December, p. 629.

"Up and Be Doing." By Colonel Sir Lonsdale Hale. N.C., December, p. 1190.

Character and Strategical Doctrine. By Second Lieutenant E. W. Sheppard. U.S.M., December, p. 238.

Letters of a Self-made General to his Son. "Fantassin." U.S.M., December, p. 270; January, p. 400.

Territorial Recruiting. By "A Centurion." U.S.M., December, p. 283.

The Chinese Army. (Translation.) J.U.S.I., December, p. 1611.

The Morocco Crisis and Churchill's Clean Sweep. By Admiral Sir E. R. Fremantle, G.C.B. U.S.M., January, p. 349.

The Admiralty and the Autumn Crisis. By Lieutenant A. Dewar, R.N. U.S.M., January, p. 357.

A Civilian View of National Service. By Viscount Milner. U.S.M., January, p. 372.

Land Settlement for Soldiers. By Colonel H. Pilkington, C.B. U.S.M., January, p. 392.

The Invasion of Tripoli. By Master Mariner. C.R., January, p. 49.

The Messing of the Soldier in Peace and War. (Continued.) By Captain R. J. Kentish, R.L.Fus. A.S.C., January, p. 8.

Description of a Field Kitchen invented by Captain Marinitsch (Russian Cavalry). A.S.C., January, p. 20.

The Turco-Italian War. By Képi. B.Mag., January, p. 126.

The Growth of Expenditure on Armaments. By Edgar Crammond. Q.R., January, p. 224.

Some Instances in Modern Wars of the Mystification of the Adversary. By Lieutenant-Colonel C. Ross, D.S.O. P.R.A.I., January, p. 443.

The Revolution in China. By J. O. P. Bland. N.D., January, p. 493.

"Ninety-eight"—A Military Warning. By Irish Field Officer. N.D., January, p. 514.

- The Sovereignty of the Air. E.R., January, p. 141.
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 Map Projections in Actual Use. By A. R. Hinks, M.A. R.E.J., February, p. 91.
 The Fate of Persia. By Robert Mackray. F.Rev., February, p. 291.
 Recent changes in Admiralty Organization. By Sir W. H. White, K.C.B. N.C., February, p. 201.
 Eleven years of Foreign Policy. By C. S. Goldman, M.P. N.C., February, p. 217.
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- The development and future of submarine vessels. O.M.Z., December, p. 2108.
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- Italy's Policy and her Position in Europe. By J. Ellis Barker. F.Rev., January, p. 11.
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 Russian Ascendancy in Europe and Asia. By Captain Battine. F.Rev., March, p. 437.
 Anglo-German Differences and Sir Edward Grey. By J. Ellis Barker. F.Rev., March, p. 447.
 The Franco-German Agreement about Morocco. O.M.Z., December, p. 2011.
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- The Spirit of the New French Strategy. By Colonel F. N. Maude, C.B. P.R.A.I., December, p. 387.

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New French tactical ideas and their import. V.T.H., 1912, p. 118.

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Lessons from the Imperial German Manœuvres, 1911. (To be continued.) By A. H. J.S.M., January, p. 12.

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The method of marching of Infantry with a view to attack. By Captain Andriot. R.M.G., December, p. 664.

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Communications between England and Russia. By Capt. E. Roson, R.N. J.U.S.I., December, p. 1553.

Army Cavalry and Infantry despatch riders. By Captain von Mannagetta-Lerchenau. O.M.Z., December, p. 1957.

TRAINING AND EDUCATION.

Infantry Training, 1911. A Criticism. A.N.G., 2nd December, p. 1140; 9th December, p. 1164.

The Instruction and Training of Medical Officers in the Austro-Hungarian Army by means of War Games. By Colonel W. G. Macpherson, C.M.G. J.R.A.M., December, p. 596.

The Probable Effects of Compulsory Military Training on Recruiting for the Regular Army. By Colonel A. J. A. Wright, C.B. J.U.S.I., December, p. 1589.

The Dual Rôle of R.E. Officers. By Major A. F. Sargeant, R.E. R.E.J., January, p. 1.

The Genesis of the New Infantry Training. By Colonel F. N. Maude, C.B. N.D., January, p. 622.

The Place of Doctrine in War. E.R., January, p. 1.

The Training of a Remount. By Lieutenant S. J. Hardy, Royal Scots Greys. C.J., January, p. 1.

The Annual Training of an Infantry Company. By F. O. U.S.M., February, p. 534.

Barrack-Room Lectures. By "Yarrum." U.S.M., March, p. 659.

Weapons and shooting for Infantry Officers. By Major Franz Schöbl. O.M.Z. December, p. 1995.

Competitive Shooting. Communicated by the Austrian School of Musketry. O.M.Z., December, p. 2085.

Four days' mountain manoeuvres in the Swiss Alps (18th-24th September, 1907). By Captain Clement-Grandcourt. R.M.G., December, p. 692.

Field firing at figures on skis. N.M.T., December, 1911.

Foreign Army Manœuvres: Germany, France, Italy. O.M.Z., January, p. 77.

The Russian Infantry Training Manual. O.M.Z., January, p. 103.

Field Service Practice. By Major Hildebrand. O.M.Z., January, p. 119.

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The German Imperial Manœuvres in 1911. By A.H. J.S.M., February, p. 314.

Infantry Training. Method of instruction and conduct of battle. By Lieutenant-Colonel de Cisset. J.S.M., February, p. 296.

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The Indian Supply and Transport Corps. By Captain R. J. Slaughter, A.S.C. A.S.C., January, p. 55.

Supply of a Division in the Field, with Special Reference to the Use of Mechanical Transport. By Captain Sir P. Cunninghame, Bart., D.S.O. J.U.S.I., January, p. 9.

The Supply Service of the Swedish Army. K.V.A., Tids. No. 22, 1911.

MAPS.

The following maps have been published by the Geographical Section, General Staff, during the past quarter, and are on sale to the public :—

AFRICA.

East Africa Protectorate.—1/250,000 series, Vol. sheet, South A. 37. G.S.G.S. No. 1764. U

Northern Nigeria.—1/250,000 new series. G.S.G.S. No. 1764. 8 sheets.

South Africa, International.—1/1,000,000 map, Kenhardt sheet, South H. 34. G.S.G.S. No. 2465.

CANADA.

Canada.—1-inch series, Lachute sheet. G.S.G.S. No. 2197.

EUROPE.

Malta.—2 inches to 1 mile. G.S.G.S. No. 2340.

Turkey, International.—1/1,000,000 map, Istambul sheet, North K. 35. G.S.G.S. No. 2555.

BOOKS, PAMPHLETS, &c., WHICH HAVE BEEN DISTRIBUTED TO REFERENCE LIBRARIES.

Report of the Army Qualifying Board on the Examination for Qualifying Certificates held in September, 1911.

Report on the Competitive Examination of Officers of the Special Reserve, Militia, and Territorial Force, and the Qualifying Examination of University Candidates for Commissions in the Regular Army held in October, 1911.

Report on the Examination for Certificates "A" and "B" held in November, 1911, for Cadets of the Junior and Senior Divisions, Officers Training Corps.

Report on Examination for Promotion held in December, 1911.

Report on Examination for Admission to Staff College, 1911.

THE ARMY REVIEW, January, 1912

ABBREVIATIONS.

W., published weekly; F., fortnightly; M., monthly; Q., quarterly;
V., at irregular intervals; A., annually.

* Periodicals which can only be purchased by subscription.

Abbreviation.	Name of Newspaper or Periodical.		Price.	Place of Publication.
A.F.	Bulletin du Comité de l'Afrique française ..	M.	2 frs.	Paris.
A.F.H.	Archiv für Schiff- und Tropen-Hygiene ..	† M.	*	Leipzig.
A.H.M.	Annales d'hygiène et de médecine coloniale ..	M.	3 frs.	Paris.
A.J.	Artilleriskii Jurnal	M.	*	St. Petersburg.
A.M.B.	Artilleristische Monatshefte	M.	m. 2.50	Berlin.
A.M.P.	Archives de médecine et de pharmacie militaires	M.	2 frs.	Paris.
A.M.S.	Proceedings of the Aldershot Military Society	..	/6	London.
A.N.G.	Army and Navy Gazette	W.	/6	London.
A.N.R.	Army and Navy Register	W.	15 c.	Washington.
A.Q.R.	Imperial and Asiatic Quarterly Review ..	Q.	2/6	Woking.
A.S.C.	Army Service Corps Quarterly	Q.	2/-	Aldershot.
A.S.M.	Allgemeine schweizerische Militärzeitung ..	W.	*	Basle.
B.A.	Broad Arrow	W.	/6	London.
B.Mag.	Blackwood's Magazine	M.	2/6	Edinburgh.
B.M.J.	British Medical Journal	W.	/6	London.
B.P.B.M.	Bulletin de la Presse et de la Bibliographie militaires. (Supplement to J.M.O.B.) ..	F.	*	Brussels.
B.S.C.	Bulletin international des sociétés de la croix rouge	M.	50 c.	Geneva.
B.S.G.	Bulletin de la Société de Géographie	M.	*	Paris.
B.S.G.L.	Bulletin de la Société de Géographie de Lyon ..	Q.	2.50 frs.	Lyons.
B.U.	Bibliothèque Universelle	M.	2.50 frs.	Lausanne.
O.J.	Budgets of Foreign Countries	..	..	..
C.J.	Cavalry Journal	Q.	2/6	London.
C.Mag.	Canadian Magazine	M.	25 c.	Toronto.
C.M.G.	Canadian Military Gazette	F.	10 c.	Montreal.
C.O.J.	Colonial Office Journal	Q.	1/6	London.
Con.	Der Continent	M.	m. 1.25	Berlin.
C.R.	Contemporary Review	M.	2/6	London.
D.M.S.	De militaire Spectator	M.	1 fr. 50	Haarlem.
D.M.Z.	Deutsche militärärztliche Zeitschrift ..	† M.	*	Berlin.
E.	Engineering	W.	/6	London.
Ec.	Economist	W.	/8	London.
Emp.R.	Empire Review	M.	1/-	London.
E.R.	Edinburgh Review	Q.	6/-	London.
F.M.F.	Feuille militaire Fédérale	V.	40 c.	Berne.
F.Rev.	Fortnightly Review	M.	2/6	London.
I.J.	Intendanski Jurnal	M.	*	St. Petersburg.
I.M.G.	Indian Medical Gazette	M.	1 R. 4a.	Calcutta.
I.M.T.	Indisch Militair Tijdschrift	M.	1 fr. 50	Batavia.
Inj.	Ingeniernii Jurnal	M.	*	St. Petersburg.
I.R.	Internationale Revue (Armeen und Flotten) ..	M.	m. 3.25	Dresden.
J.A.M.S.	The Military Surgeon. Journal of the Assoc. of Military Surgeons	M.	35 c.	Carlisle, Penn.
J.A.S.	Journal of the African Society	Q.	6/-	London.
J.D.A.M.	Jahrbücher für die Deutsche Armee und Marine	M.	m. 2.50	Berlin.

Abbreviation.	Name of Newspaper or Periodical.		Price.	Place of Publication.
J.M.O.B. ..	Journal militaire Officiel	M.	*	Brussels.
J.M.S.I. ..	Journal of the Military Service Institution ..	2 M.	50 c.	Governor's Island, New York.
J.M.S.S. ..	Journal of the Military Scientific Society (Russian)	Q.	1 Ro. 50 kop.	St. Petersburg.
J.R.A.M. ..	Journal of the Royal Army Medical Corps ..	M.	2/-	London.
J.S.M. ..	Journal des Sciences militaires	† M.	*	Paris.
J.U.S.I. ..	Journal of the Royal United Service Institution	M.	2/-	London.
J.U.S.I. (N.S.W.)	Journal of the United Service Institution of New South Wales	A.	*	Sydney.
K.M. ..	Kavalleristische Monatshefte	M.	k. 2.	Vienna.
K.T.Z. ..	Kriegstechnische Zeitschrift	M.	m. 1.50	Berlin.
L. ..	Lancet	W.	/7	London.
L.A.F. ..	Comité de l'Asie française, Bulletin ..	M.	2.25 frs.	Paris.
L.B.M. ..	La Belgique militaire	W.	25 c.	Brussels.
L.R.I. ..	La Revue d'Infanterie	M.	2 frs.	Paris.
L.S.M. ..	Le Spectateur militaire	F.	2 frs.	Paris.
M.A.G. ..	Mittn. über Gegenstände des Art.- u. Genie-Wesens	M.	*	Vienna.
M. Art. ..	Memorial de Artillerie	M.	*	Madrid.
M.B.A.R. ..	Monthly Bulletin of the Bureau of American Republics	M.	25 c.	Washington
M.C. ..	McClure's Magazine	M.	25 c.	New York.
M.I.E. ..	Memorial de ingenieros del ejército ..	M.	*	Madrid.
M.P.G. ..	Mitteilungen Petermann's	M.	m. 2.	Götha.
M.R. ..	Marine-Rundschau	M.	m. 2.	Berlin.
M.W.B. ..	Militär-Wochenblatt	† W.	20 pf.	Berlin.
N.A.R. ..	North American Review	M.	35 c.	New York.
N.C. ..	Nineteenth Century	M.	2/6	London.
N.D. ..	National Defence	Q.	2/6	London.
N.G.M. ..	National Geographic Magazine	M.	25 c.	Washington
N.I.A. ..	Nation in Arms	M.	/3	London.
N.M.B. ..	Neue Militärische Blätter	W.	60 pf.	Berlin.
N.M.T. ..	Norsk Militært Tidsskrift	M.	*	Christiania.
N.R. ..	National Review	M.	2/6	London.
O.M.Z. ..	Strefleure militärische Zeitschrift, zugleich Organ der militär-wissenschaftlichen Vereine	M.	*	Vienna.
P.J. ..	Preussische Jahrbücher	M.	m. 2.50	Berlin.
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P.R.A.I. ..	Journal of the Royal Artillery	M.	2/6	Woolwich.
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Q.D. ..	Questions diplomatiques et coloniales ..	F.	75 c.	Paris.
Q.R. ..	Quarterly Review	Q.	6/-	London.
R.A.G. ..	Rivista di Artiglieria e Genio	M.	*	Rome.
R.C. ..	Revue de Cavalerie	M.	*	Paris.
R.d'A. ..	Revue d'Artillerie	M.	*	Paris.
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Abbrevia- tion.	Name of Newspaper or Periodical.		Price.	Place of Publication.
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R.M.S. ..	Revue militaire suisse	M.	*	Lucerne.
R. of R. ..	Review of Reviews	M.	/6	London.
R.T.C. ..	Revue des Troupes Coloniales	M.	2 frs.	Paris.
S.Z.A.G. ..	Schweizerische Zeitschrift für Artillerie und Genie	M.	*	Frauenfeld.
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U.S.C. ..	United States Cavalry Association Journal ..	Q.	50 c.	Fort Leaven- worth.
U.S.G. ..	United Service Gazette	W.	/6	London.
U.S.I. ..	United States Infantry Association Journal	Q.	50 c.	Washington.
U.S.M. ..	United Service Magazine (Colburn's) ..	M.	2/-	London.
V.R.K. ..	Vvestnik Russkoi Konnitsi	F.	*	St. Peters- burg.
V.S. ..	Voyennii Sbornik (Military Journal) ..	M.	*	St. Peters- burg.
V.T.H. ..	Vierteljahrshefte für Truppenführung und Heereskunde	Q.	*	Berlin.

APPENDIX II.

NOTES ON UNIVERSAL TRAINING SCHEME— AUSTRALASIA.

(A) AUSTRALIA—TO AUGUST, 1911.

Australia is at present applying the principle of universal training to cadets only, and the formation of the new Citizen Force has not yet really commenced. In July, 1912, however, the first batch of recruits from the Senior Cadets will join the new Citizen Force. These recruits—estimated at about 20,000—will be utilized in the first instance to bring existing units up to establishment, and it is unlikely that fresh units will be formed for some time to come.

The following table gives details of the registration, &c., of Senior and Junior Cadets up to August, 1911. The training of the cadets is being confined to the most populous centres included in a narrow strip of country from Cairns in the north of Queensland to Port Augusta in South Australia. The number of hours' obligatory Training to be carried out annually by Senior Cadets has been reduced recently from 72 to 64.

(a) SENIOR CADET REGISTRATION, MEDICAL EXAMINATIONS, AND EXEMPTIONS TO 31ST AUGUST, 1911.

Military District.	Total Registrations in Training Areas.	Total Medical Examinations.	Number Medically fit.	Percentage of Medically Examined who are unfit.	Total Exemptions granted in Training Areas.	Total Number liable for Training.	Total Number actually in Training.
Queensland...	24,282	13,721	12,730	7·2	11,277	12,604	11,637
New South Wales ...	53,625	36,880	34,604	6·2	19,306	34,319	33,340
Victoria ...	48,211	32,591	30,674	5·9	15,774	30,298	29,022
S. Australia .	14,694	11,131	10,439	6·2	5,241	9,453	8,911
W. Australia.	6,861	5,098	4,575	10·2	2,512	4,349	3,858
Tasmania ...	6,102	3,395	3,239	4·6	2,706	3,396	2,872
Commonwealth ...	153,775	102,816	96,261	6·4	56,816	94,419	89,640

(b) JUNIOR CADET MEDICAL EXAMINATIONS FOR AUGUST, 1911.

Military District.	Total Number Medical Examinations.	Number Medically fit.	Percentage of Medically Examined who are fit.	Number Unfit and Temporarily unfit.	Percentage of Examined who are Unfit and Temporarily Unfit.
Queensland ...	3,290	3,178	96·6	112	3·4
New South Wales ...	7,444	7,272	97·7	172	2·3
Victoria ...	11,038	10,917	98·9	121	1·1
S. Australia ...	388	383	98·7	5	1·3
W. Australia ...	555	542	97·7	13	2·3
Tasmania ...	220	219	99·5	1	0·5
Commonwealth ...	22,935	22,511	98·2	424	1·8

(B) NEW ZEALAND—TO 31st DECEMBER, 1911.

The posting of all Senior Cadets and Territorials has now been completed, and the majority have been enrolled and sworn in. The attendances for the purpose of enrolment average throughout the Dominion between 60 to 70 per cent. of those registered. The balance is accounted for by the fact that the population is very shifting, and that about 20 to 30 per cent. have changed their residences since they registered, and that, therefore, the notices summoning them to attend have not reached them. A small percentage have sent reasonable excuses for non-attendance, and not more than 5 per cent. at the outside have deliberately absented themselves.

Lists have been made of (a) those who have not registered, (b) those who having registered have not taken the oath, (c) those who having fulfilled the conditions of (a) and (b) have absented themselves from parade, and they will be dealt with early in the New Year. The numbers who have failed to register are very small, probably not over 1,000, of both Territorials and Senior Cadets, in the whole Dominion.

Registrations to date are:—Territorials, 28,000; Senior Cadets, 30,000.

Owing to the General Elections and to preparation for the Christmas holidays the commencement of the training was somewhat retarded, and the parades hitherto held have been mainly confined to enrolment, swearing-in, measurement for clothing, &c. A very good spirit has been shown as a rule of all those preliminary parades, and the keenness and willingness of the young men and cadets have been remarkable.

Permanent Quartermaster-Sergeants have been appointed to each Mounted Rifle Regiment and Infantry Battalion, and they are now receiving arms and clothing which will be ready for issue to the recruits when training recommences early in January. About 10,000 sets of clothing and 39,000 rifles have been already issued from headquarters.

Owing to the regretted death of Colonel Hawkins, Colonel Burnett-Stuart is temporarily combining the command of the Canterbury District with his duties as Director Military Operations, pending the return from Home of one of the Senior Officers now under training there.

The first examinations for promotion for Officers of the New Zealand Staff Corps and the Royal New Zealand Artillery have been held, and the papers sent Home for correction. The results will be cabled out as soon as known.

Two Officers have proceeded to the Staff College at Camberley, three Officers have gone to India, and one Home for instruction, in addition to those already there.

Senior Cadet Companies have been formed throughout the Dominion and appear for the first time in the Army List. Officers for them are being obtained by degrees.

Arrangements are in progress for the Annual Camps to be held in the autumn, and though the training at them will be mainly elementary, the fact of their being held by Regiments, Battalions, &c., will give a good start to the Regimental and Battalion organization and administration.

The first number of the New Zealand Military Journal has been issued by the General Staff; also a pamphlet on the Administration of Military Law in the Dominion by the Judge Advocate-General.

A considerable number of artillery horses have already been purchased ready to horse the new guns which are expected early in the New Year.

Training under the new conditions will commence universally between the 3th and 15th January, 1912.

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